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I.

THE EDUCATIONAL VALUE OF COLLEGE STUDIES.

Until quite recently the typical college course was very simple. Latin, Greek, and mathematics occupied the important places, and no other studies were allowed to interfere with their successful prosecution. Of late, however, all this has been changed. Many new sciences have grown up, and are demanding and securing places in our college courses. Almost every year sees the advocates of some new science securing the ear of college authorities and getting a representation in the college faculty. The old studies have been reduced in quantity to make place for the new; and yet there is an overcrowding which it seems almost impossible to avoid. Even if the old studies were entirely displaced, there would not be room for all the new ones, if they are pursued in that thorough manner which the advocates of each study demand for it. We cannot, therefore, hope to satisfy all the various elements that wish a representation in the college course; and hence comes the necessity to examine into the claims of each science, to see what it can do for the student, and how it can be taught with the greatest efficiency, and with the greatest economy of time.

A word, however, may be needed to define the place of the college course in a system of education. Elementary education is for the growing child, who is interested only in the living present. The academy takes the boy while yet so young as to need strict discipline and constant supervision. The

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college student is a budding man. The interests and feelings of a man are active, but maturity is lacking. He has a love for science, yet without that power for thorough study that comes in later years. The university and professional schools are for the mature man, whose plans for life are already formed, and who wishes to master some science or profession for definite ends. As college life comes just before maturity, that college is the best which gives its students work suitable to this stage of their development, and in constructing such a course of study, a measure of educational values is of vital importance. Before seeking for such a measure, certain important changes in the studies themselves or in their relation to one another, deserve attention, since these changes have greatly modified many aspects of modern education.

In the first place, there is a large increase in the number of deductive sciences. Our ideas on educational matters have been derived largely from the Greeks, and in their time geometry alone had acquired that degree of perfection which made it the typical deductive science. At the beginning of modern times, physics assumed a similar form, and is at the present time almost as deductive and abstract as geometry. It must also be kept in mind that mathematics, if thoroughly studied, now needs a much larger space in the curriculum than was necessary in the time of the Greeks. Elementary geometry was what Plato had in mind when he said that geometry was essential for admission into his school. Now we have a large number of mathematical sciences, each of which has a greater content and is more complicated in its deductions than was the geometry of Plato.

A second peculiarity of our present educational problems lies in the rapid lengthening of the present technical courses, and the additional studies needed to prepare the student to pursue his professional work with advantage. When these studies were first admitted into our colleges, the amount of time given to them was small, while a large part of the work of the student was directed toward his general culture. The higher standards now demanded of professional men require

that the college should devote more time to practical ends. There is also a large increase in the number of studies which directly prepare the student for his profession. These two facts taken together show that but little time is left for those studies which give culture to the student.

The third preliminary fact of importance is, that most of these technical studies require a long course of mathematics before the student can take them up. Mathematics is now a necessity for almost all the physical sciences, and consequently the mathematical studies have to receive an emphasis in all work preparing for them. As an outcome of this change, mathematics must be regarded in a different light from that which has been customary. For a long time it was mainly a culture study. As it led to no practical results, it could be pursued in any manner that best tended to develop the mind of the student, and thus those parts and problems which had the highest culture value could receive an emphasis. As it is now taught, it has lost much of this exceptional position. Professional mathematics is substituted for educational mathematics. In other words, all that does not lead directly to some professional end is cut out of the course of study. The influence exerted by the technical courses upon the college curriculum is so great, that even those who wish to pursue mathematics as a culture study are compelled to study it in books prepared for those who are pursuing it for a practical end, and thus they study the subject in a way fitted for professional work rather than as a means of culture. In all our text-books the influence of the study of mathematics for practical ends is apparent. They emphasize those theorems that have the greatest utility and reduce the other parts to a minimum.

The problem of education values may be looked upon in two ways. We may, first of all, compare the education derived from mathematics, language, physics, chemistry and economics, and inquire which of these studies, as a whole, gives the most culture to the student. This is the way it is usually presented in essays on education. It is said by those who

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represent culture, that it is better for the student to become a mathematician or a linguist, even if he does not intend to use the knowledge in his profession, because the power gained will make him a better engineer or chemist. I do not wish to underestimate the importance of this point of view; yet there is another conception of education that I regard as of more importance. It may be stated thus: shall a subject be taught with the view of making the student a master of it, and thus to enable him to obtain a utility from it, or shall it be taught with the purpose of producing the greatest effect upon the mind and culture of the pupil? Can, for example, a student get the educational value of mathematics without becoming a mathematician? Does he have to be a linguist to get a like result from language? If it is not necessary to be a thorough master of mathematics or of languages to get the culture they give, it is important to know what part of the study is of most educational value. All our sciences are complex wholes, some parts of which help the student in his mental growth, while others are detrimental, and even make the student a narrower man instead of a broader one. A long course in a study may be necessary to a person who intends to be a specialist in that study or in a kindred one. The whole is a unit to him, the loss of any part of which would disqualify him for good work in this line. He must do a certain amount of work, not for culture, but for the indispensable knowledge which he needs for the best use of his own science. The educational value, however, lies not in the knowledge imparted, but in the effect upon the student. It gives him a better capacity for work, a faculty to do other work of a like character, purer ideas of life, greater confidence in his intellect, and keener appreciation of his moral obligations. The utility of a study, therefore, and its educational value, cannot be too sharply contrasted. Yet this difference is too much overlooked in forming the college courses. All our practical courses are long and valued for their utility. These courses are split up into parallel sections, each having some one science, or group of sciences, prominent in them. This ten-

dency has been dominant in the history of recent education, and as a result the student usually chooses, early in his college life, between several parallel courses, and takes one for its utility to the exclusion of all others.

If the college course is to be arranged for its educational value, a very different plan must be adopted. Each study must be examined, to see what it can do for the mental development of the student, and only that part of it in which this feature is prominent can be admitted in the college course. This plan would necessitate that each study be divided into two parts; the undergraduate, or college course, where that part is studied which has the greatest influence in developing mental power, and the post-graduate course, where further study is made for utility of the content. It should not be the aim of the first to make a student a mathematician, a linguist, a scientist, or an economist. A senior may be without distinction in these, or other studies, and yet leave college much more strengthened in character and with a greater intellectual power, than if he had won the favor of some one professor by becoming an expert in his line.

I agree heartily with the thinkers of the old school in desiring to keep the college course a culture course. I differ with them, however, by thinking that certain parts of each of the new sciences contain elements that have as great an educational value as that of the old studies which they have displaced. The reason why the mental growth of students of science is at all in question, arises from the fact that the newer sciences are so largely pursued merely for professional ends, and hence different parts of each science receive a very different emphasis from that which would be given to them if pursued solely to develop the intellectual power of the student. A certain chemical analysis, for example, may be absolutely necessary for a student who wishes to analyze sugar; and if a course in chemistry is directed solely to making practical chemists, these parts must receive attention and displace other parts of chemical knowledge which do not lead directly to some practical end.

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The main defect of our college courses is not that we are studying the wrong subjects—utility studies instead of culture studies. All studies are utility studies or culture studies according to the manner in which they are taught. The defect lies in the fact that we teach each part or problem in the science for its utility, and not for its educational value. Each lecture or recitation is a preparation for the next one. The part is regarded only in its relation to the whole. Anything not contributing to the knowledge of the whole is cut out, and what is included in the instruction is valued only as a step to the next part or problem. To secure the highest educational value, each problem should be thought of as though it were a whole,—an end in itself,—and the student should acquire a knowledge of it entirely regardless of its utility as a part of the science which he hopes to acquire.

Perhaps the best illustration of what I mean can be found in the elements of geometry as they are now taught. Why, for example, do we find thirty-two propositions in the first book of Euclid? Simply because the thirty-two theorems, together with a few corollaries, are needed for the reasoning of the subsequent books. There are many other problems similar to the thirty-two which we find in Euclid, but they are omitted simply because they do not form a necessary part of the chain of reasoning by which the whole geometry is bound together. The propositions which we use are not those forming the best specimens of reasoning, and therefore most calculated to develop the mind of the student. No time is allowed to diverge from the beaten track. As soon as these necessary propositions are mastered, the student passes on to the next book, where the same process is continued. Here, again, only those problems are found that are of utility to the student in the subsequent books. Everything is cut out that does not lead to this one result. When, therefore, we have ten books of geometry arranged in this way, it seems only just to say that the student obtains from each of them, simply its utility, and not culture, which should be the aim of the student.

To illustrate my meaning further, in showing how geometry might be taught for its educational value, suppose that in Euclid the fifth proposition was omitted, and this the student himself must supply. Would not the effort of the student in endeavoring to supply this missing link be of much greater educational value to him, than the learning of a dozen propositions demonstrated in full in his book? If such a process was pursued, the student would have to guard against many errors of reasoning, from which at present he is kept by the completeness of the demonstration contained in the book. No one thinks of doubting the truth of the demonstration that Euclid gives, nor does the student try of himself to supply another; yet all the various elementary propositions could be proved in some other way should the student be given the time and the proper encouragement to work at them.

Not only has the mathematics in geometries sunk from an educational to a utility study, but a condensed form of mathematics has taken the place of the completer demonstration of the old geometries. Algebraic demonstrations are substituted for those of Euclid, which, while they add to the completeness and utility of the study, yet are at the expense of its educational value. The student does not realize what has been proved; he passively assents to the conclusions that have been reached in ways of which he is not fully cognizant.

What is true of mathematics is also to a large degree true of the study of physics. There has been a complete change in the character of physics during the last fifty years. The old demonstrations, which were based on experiment, have been displaced by mathematical formulæ. Astronomy, also, has gone through this change in the course of its development, although not to so great a degree as physics and mathematics. Chemistry is undergoing a like change, and may soon be fully as mathematical and abstract in its methods of proof as physics has already become. Even in biology the same change is taking place. Natural history has been displaced by deductive biology, and the influence of Darwinism has given to the

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deductive parts a prominence which they never had before. We must, therefore, look elsewhere than to these sciences for culture studies if these tendencies proceed much farther. Another age may find them all as deductive and as abstract as mathematics, taught only for their practical utility, and each part presented merely in its relation to the whole body of doctrine of which it is a part. Any facts, however interesting they may be in themselves, will be overlooked if they do not occupy a necessary place in any scheme by which the whole science is presented.

The educational value of any subject, however, cannot be determined from its content alone. It depends largely upon inherited qualities of the students and the classes in society from which they come. As an outcome of the present and past environment and education of mankind, some mental faculties have been much more highly developed than others, and hence those studies which call these faculties into activity present the least difficulties to the average student. If a student has inherited those qualities which make a science easy for him, it should not receive that emphasis in his systematic education that would be otherwise necessary. The more fully developed any faculty is, the less relative attention should be given to it. The training of the student previous to entering college is also of great importance. At least a third of the time in the elementary and secondary schools is devoted to mathematical studies. As a result our students come to college after studying those parts of mathematics which have the highest educational value. They have as much mathematics as Plato required, and could stand the tests that he laid down.

From this point of view, the highly deductive sciences give less culture to college students than other studies. Mathematics, as an illustration, has been studied so persistently and so thoroughly by many generations, that we find a mathematical faculty in our average student which was not possible at an earlier period. By this I do not mean that there are no persons to whom mathematics, even in its elements, do not

present great difficulties, but college students do not usually come from that part of society. We have, as a rule, representative of families among whom for many generations mathematics in some form has been so thoroughly studied that the minds of the children are capable of receiving mathematical instruction, not only with less trouble, but also at an earlier age than was formerly the case.

The educational value of a subject also depends largely upon the society or civilization of which the student is a part. That study gives the greatest culture that trains the mind for the class of judgments which must be made most frequently by the average citizen. As the phenomena to be dealt with in life are complicated and complex, the less deductive sciences correspond more closely to these conditions, and give more culture. If a student in college has been drilled mainly in simple reasoning from unquestioned premises, he goes out in life unprepared to deal with problems where the premises need examination, and the conclusions must be modified by making due allowance for the conflicting causes which combine to produce the given result. It is, I think, usually overlooked, that geometrical reasoning, when applied to the affairs of men and society, is a kind of fallacy. In books on logic, like that of John Stuart Mill, this kind of fallacious reasoning is fully dealt with. The errors that flow from it are so numerous, that any one who gets into the habit of reasoning mathematically is sure to make serious errors when he reasons upon the affairs of every-day life. The mathematician reasons from a few simple premises, and reaches conclusions which are never dependent upon modifications of his premises. He thus becomes a model of poor reasoning, unfit for imitation by any one who deals with more complicated phenomena.

In most of the sciences the errors from reasoning dogmatically from simple premises are apparent; yet perhaps political economy furnishes the best example of them all. The mistakes of the orthodox economist arise from this fallacy. He only allows for a very few premises in his reasoning, and the conclusions to which he arrives are seldom modified by the intro-

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duction of any new facts. When he reasons about foreign trade, the laws of money, of exchange, or distribution, he starts from some one or few axioms, and then reasons from them with all the precision of mathematical demonstration, and regards his results as conclusive as though he had been occupied with a mathematical problem.

The educational value of a science depends also upon the stage of its progress. A science is complete when it has reached the deductive stage. Then all the various parts are closely joined together and form one body of truth. It begins with an inductive stage when the opposite is true. All the generalizations depend upon observation and a study of the facts. These two stages—the deductive and inductive—cannot always be sharply contrasted the one with the other. At some period in the development of each science, it is in a transitional stage, passing from one to the other; and in this stage it has its greatest educational value. On the one hand there is an immense mass of inductive facts which have not been co-ordinated in a way to show the law upon which they depend. On the other hand, certain parts of the science have been so arranged that the law can be clearly seen. These later parts have become deductive, and from them can be seen the method which must be pursued in the other parts in order that they too may be changed into a deductive form by the discovery of some new law. This stage of transition, from the inductive to deductive, encourages the self-activity of those who study the science. There is an incentive to study and to make discoveries, which is not possible in a mere deductive science on the one hand, or in a mere inductive science on the other.

The sciences also that are in a state of transition, have the great men and the enthusiastic teachers. When, for example, had we the greatest mathematicians? Was it not at just that period in the development of mathematics when a part of its truths had already been demonstrated, and thus incentive was given to discover the basis upon which other propositions rested? The same facts, also, are clearly shown in the history

of physics, astronomy, and other sciences, that have already passed into the deductive stage. Just at that period when the transition from the inductive to the deductive was being made is that time when its great men appear. Biology, for example, at present possesses the largest number of our great scientific men, simply because it is in a state of transition, and this state prompts the zeal, self-activity, and mental growth by which great men are made. The study of a science in this stage of its progress makes the great men, and not the great men the science. The gaps in a science are the incentives to the industry and activity which create the power in the students of the science to fill them.

If a science is taught for culture, it must be presented as it was when in a state of transition from the inductive to the deductive stage. When a science is beyond this point, it should be presented not in its final form, where its utility is greatest, but in the form it had at an earlier date. Present a science as it was when its greatest thinkers lived and worked, and it will be most suitable for college students. Geometry among the Greeks, when there were certain gaps in its reasoning not yet filled, is the kind of geometry that should be a model in our schools, rather than the present complete form, which is always presented. The Greeks were right in attributing a great educational value to geometry, as it was then in that state of transition which uses both inductive and deductive reasoning. We are wrong in giving as high a value to it, because it is now a complete science, and as a result a lifeless science, unless modified in some way by the teacher, so as to throw it into a form more like what it was in the ancient world. Astronomy in the time of Kepler, and physics in the time of Newton, although these sciences then lacked that perfection which they now have, gave to teachers and students an enthusiasm not to be obtained from the condensed and complete forms in which the sciences now are.

The educational value of a science depends also upon the character of its premises. The habit of using premises which the student does not question creates a dogmatic spirit. It

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dwarfs his mind by confining him to that form of logic which deals only with relations of premises to the conclusion. Such reasoning excites little interest or activity. It calls attention to the details of reasoning without awakening a desire to investigate its foundations. Formal reasoning is the same to all men and depends for its correctness merely upon the rules of logic. The study of premises, however, is a study of mankind and of the laws of thinking, and is a necessary condition to good reasoning upon practical subjects. The same premise has a different degree of force upon minds in different stages of development and in different social environments. To question the premises from which one reasons, opens up the broadest problems of psychology, and forces one to examine into the complicated phenomena of the society in which one lives. The feeling, therefore, that his premises are open to discussion, gives the student much greater incentive to accurate thinking than he would have if he were studying a science with axiomatic premises.

The opposite of this is of course true in professional studies pursued for utility alone. In them an unquestioned confidence in the premises used is a requisite. No one would become a successful engineer or chemist who had not been drilled in the elements of his subject until he acted upon its principles axiomatically. Drilling and cramming may make good professional men, but they destroy the independence and self-activity of the student, and make his thinking mechanical and his reasoning dogmatic. If a good professional man is wanted, let him study deductive sciences with unquestioned premises, but beware of praising the same course of study for the culture it gives.

I have thus far called attention to four factors which demand attention in a discussion of education values. There are doubtless other factors worthy of consideration, but these, I feel sure, are those which throw the most light on the present aspects of our educational problems. I will repeat them for the sake of emphasis: (1) the inherited qualities of the college student; (2) the life the student is to lead and the

judgments he must most commonly make; (3) the state of progress of the science—whether inductive, deductive, or transitional; (4) the character of the premises of the science and the confidence the student has in them. If these are the leading factors, they show that there can be no cast-iron rule as to the educational value of the different studies. Each age must decide the problem for itself, as the elements in it are modified by every change in the environment, in society, and in men themselves. Nor can the contest be decided in any such a crude way as is involved in the struggle between science and language.

The demand of the present age for more science in our culture courses is in the right direction, but it must not be overlooked that the very success of science will change the whole aspect of the present contest in the near future. To make all the physical sciences completely deductive is the goal of our civilization. May this end soon be reached! As we approach the goal the utility of these sciences will so rapidly increase that they will be taken up merely for professional ends like law or medicine. Thus, with the increase of their utility to man, they will be of less value in educating men. Whatever makes them more fitted for utility studies makes them less fitted for general culture. Coming ages will thus be forced to look elsewhere for a large part of the studies which are to be prominent in the college curriculum of the future.

It will be seen, I hope, that I have no desire to disparage the deductive sciences. Their importance to men cannot be overestimated. But in the educational problem it is not with the mature man and his needs that we have to do. As teachers, we are interested only in growing minds and how they may become best fitted for the world in which they are to think and act. We can hope, for example, that electrical engineering may become more deductive and thus more useful, and at the same time think that this desirable change makes electricity less fitted for a college study. But where can we look for studies with a high culture value if the physi-

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cal sciences have already become or are soon to become utility studies? Of course, from the premises from which I have started, there can be no general or final answer to this question. The conditions of the problem must be changed from age to age by the progress of science and mankind. Yet for the near future the solution of this problem does not seem difficult. Those sciences are likely to be the progressive sciences that are based upon and grow out of the physical sciences. There is a definite order in which the different sciences stand to one another, and each science must wait its turn before its problems can be solved. Mathematics, astronomy and physics, for obvious reasons, were the first sciences to be studied in a systematic way, and hence were the first to reach the deductive stage. Chemistry and biology, being most closely related to them, next received attention and became progressive as soon as the knowledge of the first group was complete enough to allow efficient work to be done in the second. The third group is the moral sciences, and it is in them the great advance of the near future seems to lie. As soon as the sciences that precede them become deductive, they can get the proper groundwork upon which to build. Even at the present time their growth and progress is remarkable, and with that additional help which will soon come from the more complete form of the sciences upon which they depend, they will be the centers of intellectual activity and become the studies having the greatest educational value. Politics, economics, psychology, and ethics are the group of moral sciences in which the hope of the future lies, and to them increasing attention must be given until they form a prominent part of the college course. In the education of the future, they are likely to have that prominence that the mathematics obtained in the past. Had Plato lived in our day he would see in these sciences what he then saw in geometry, and would reconstruct his teaching so as to conform to the new conditions.

Judged by the standards used in this essay, these sciences form an ideal group. They develop those qualities and facul-

ties which are now most deficient in men. Bearing directly on the affairs of everyday life, they cultivate that class of judgments which are of the most value. The progressive state of the sciences will make the teachers enthusiastic, and the interest which the students naturally have in social problems will increase their energy and self-activity. The character of the premises will discourage dogmatism and prevent the errors in reasoning to which students of mathematics are liable. The mutual dependence of these sciences upon one another will force the student into so many lines of investigation that he will secure that breadth and culture needed to keep him from becoming a narrow specialist.

When college authorities fully recognize the value of moral sciences, and give them their proper share of the time of the college student, the advantages of a college education will be much more decisive than they now are. It cannot be charged that college life makes students unpractical when the vital interests of all men have a prominent place in their education. Teach the young to reason correctly, to appreciate history, and to love facts on their own account, and they will carry through life a way of acting and thinking that will make them useful in business and an honor to society.

Do not think, however, that because I would give to the moral sciences a prominent and perhaps a dominant place in the college course, that I would have the college turned into a special school for their study. An ideal college course must always avoid such a result. The value of any study lies largely in its elements. Complete courses, making the student a master of what he studies, must be given only in graduate work. The college course must select only those problems in each science that have a high educational value, and study them for this value, and not for their utility as parts of a connected whole. In this way all the sciences can have an adequate representation in the college curriculum without that crowding which at present is so much to be regretted. We might not make our students masters of any science, but we would do far

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better, because they would be masters of themselves, without bias, intolerance, or bigotry, and ready to take up the duties of life with an earnest purpose to make the most of themselves and the society of which they are a part.

SIMON N. PATTEN.

UNIVERSITY OF PENNSYLVANIA,
PHILADELPHIA, PA.

II.

IS THERE A SCIENCE OF EDUCATION? (II)

III.

The teacher ought to be a man of ideals. The end of education is ethical. We desire to give the state a loyal subject, and society a worthy fellow-worker. To this end we labor with our pupil. Is it possible, then, to define in any scientific terms the moral ideal? Is it useful for the teacher to have studied ethics? To this question Dilthey has already responded, in his skeptical fashion, that, doubtless for good reason, "no moral system has yet won universal assent." Upon this side of pedagogy he lays small stress. The universal type of organization seems to be formulated by him in biological rather than in ethical terms. The child is to be made an harmonious living organism. The ends of life in the abstract cannot be universally defined. There are some who would regard Dilthey's skepticism in this matter with a mingling of dread and contempt. But to begin a discussion of the matter here would lead us too far afield in philosophy. I myself hold to the possibility of an universal ethical principle. But of matters strictly philosophical, this is no place to speak.

Yet all the while I feel the great difficulty of giving much practical aid to teachers, especially in this country, and at the present time, by demanding of even the more learned class of them an universal attention to theoretical ethics. The call to become conscious of one's moral ideals, both for the sake of one's own salvation, and for the sake of teaching others, is a call that comes to men in very different degrees and forms. Most commonly men feel the call in religious form, and for reasons closely connected with their faith. Our clergymen are our principal ethical advisers in this country; and, on the whole, it is well that this should be the case. Yet

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the religious is not the scientific spirit, although there is indeed no proper hostility between the passion to be holy, and the disposition to scrutinize scientifically what holiness is. I should be glad indeed if more of our teachers were early possessed of a share of the latter interest. We should have less philistinism in our schools, less hoodwinking of the childish conscience, less cowardice, less prudery, and more purity. But when I begin to ask who shall teach the teachers ethics, or how a critical and yet a truly reverent study of the great ideals and passions of humanity shall be popularized among them, I confess that I often see how philistinism is indeed far better than moral indifference, and how we might easily exchange the unwisdom of a portion of our customary clerical teaching of morality in this country for a kind of superficial reflection upon ethics, whose outcome would be very evil not only for our teachers, but for their pupils. As a dear friend of mine loves to say: Better strenuousness of devotion even to a false moral ideal, than a well-defined ideal but no strenuousness. In short, it is in the world of devotion to ideals that loyal instinct is most often the securer guide as against science.

Yet, despite all this, I am impelled to insist that the pedagogy of the future will have, as one of its duties, the encouragement of a reasonable ethical reflection among our teachers. I care indeed little, whether or not this reflection is generally pursued under a constant theological supervision. Theology is but the eternal religious passion of humanity, limited (and sometimes, indeed, even enchained) by the historical forces that have formed our relative and often transient imaginings about the world beyond sense. I believe in the passion, and in its true and eternal objects, too deeply not to love even its more transient forms. I do not find its ministers all equally wise guides as to ethical matters; and no wonder—since they do not find one another so. But they have done so much for us in this country that we can safely trust them in the future also to awaken higher reflective thought concerning ethical matters whenever the time clearly calls upon them to

lead in this direction. And if ever an age showed signs that such a time was soon coming, surely the present age does so. I desire, then, to see more efforts, both within and without the churches, to train young teachers to a clear consciousness about duty and about its meaning. And I desire the study of ethics, without ceasing to be truly devout, to become also, as time goes on, more and more scientific in spirit and in content. Of the difficulties in the way of such a study in this country, in so far as they immediately concern the educator's business, the present widespread controversy concerning secular and religious instruction in the public schools gives a sufficient hint. In short, it is here the very value of ethical insight itself, both for the teacher and for his pupils, that renders a truly scientific treatment of moral questions, and a truly scientific training of teachers, especially difficult.

IV.

The teacher, I say, should furthermore be a naturalist, and the department of natural history which directly concerns him is called psychology. The great successes of this infant science of late years have been indeed, of themselves, not without certain drawbacks for the practical teacher. Psychology is constantly growing as a whole more complex, and therefore more difficult to survey in its entirety; while, on the other hand, there have been recently developed within its field several very attractive, very special, and therefore very limited lines of research, which have drawn the public attention to themselves in such a fashion as to endanger, through hasty and one-sided generalizations, the proper sense of the magnitude and the difficulty of the whole science. In two directions, therefore, teachers who have looked to psychology for light as to the "science of education," have found their vision confused. Did they undertake to study psychology as one doctrine, they soon found themselves unable to grasp its manifold aspects. It confused them with the multiplicity of its researches. They were fain to go back to some older textbook, wherein, as in Spencer's *Psychology* all the "principles,"

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as they used to be, were "unified." Hence the antiquated character of most of the compendious treatises on "pedagogical psychology." These may or may not be useful. Nearly all of them are very highly inadequate. But did the teacher, on the contrary, study his psychology only in monographs, then, of late years, certain attractive topics, such as hypnotism, for example, made themselves too prominent from among the mass of researches, and psychology seemed a wonderland of singular and one-sided generalizations. I have not yet seen a "system," or a "science of pedagogy," founded solely or mainly on the principle that the teacher ought to be primarily a hypnotizer; but I daily expect to find such a treatise announced. It would hardly be more one-sided or crude in its own way and day than Spencer's book on "Education" was in its time and environment. I doubt if it would have the same success; but it might succeed in bringing the "science" into a little fresh discredit. For the rest, to speak of more serious matters, I know of persons who have struggled with Preyer's admirable monograph on the *Mind of the Child*, in a vain endeavor to extract from its pages an infallible rule of procedure in dealing with very young children. The scientific monograph, even where it is of the best in itself, is in general dishearteningly limited as to its immediately practical outlook. Let me, then, in view of this difficulty, suggest what the direction is in which the study of psychology, as adapted to the use of teachers, ought to progress.

First, then, let the young teacher remember that it is not the "system" of a psychological science, not the exhaustive theory of the "powers of the human mind" that he needs, but rather the psychological spirit: that is, the love and the skill that are required for the purposes of mental diagnosis. When I said that the teacher should be a naturalist, I meant that he should be in the habit of observing the mental life of children for its own sake, and of judging the relative value of its moods and tendencies. For such observation of the live child his study of published psychological researches ought primarily to be meant to prepare him. Preyer's monograph

on the *Mind of the Child* is, indeed, from one point of view, little more than a dry mass of details, with a few generalizations of a sort that no teacher will be able to use without much personal experience and skill. All this is necessary. It was not Preyer's first object to be pedagogical, but to contribute facts to his science. But see how useful just this collection of dry facts may become to the teacher if he reads the book, not for the pedagogical rules that he may have vainly hoped to find in it, but for the acquirement of the habit of observation that the book exemplifies. These early frowns and squintings of the infant, these cries that slowly become more vocal, and that prepare the way for language, these primitive gestures that form the basis for the later life of expression in the child—how vain to study them merely for the abstract pedagogical rules that somebody might try to deduce from them! But meanwhile, observe,—behind all this chaos of symptoms is the life, the consciousness, that is hereafter to grow so spiritual and significant. And this life, this consciousness, just that it is which you as teacher are to follow, to comprehend through sympathy if not through formulas, to diagnose; yes, to guide. Well then, get in the habit of examining, step by step with Preyer as he observes what mental processes there are going on here. When the infant learns to fix his gaze, when he studies his moving fist in the field of vision, when he bites his own foot as if to find whether it *is* his own, when he babbles his chaos of noises as a preparation for speech, follow the process, and follow it just as a training in mental diagnosis. You will not thus learn many formulas; but you will learn the art of comprehending mental symptoms. Just in this fashion naturalists always have to work. What is here in this live thing? Why does it move thus? What is it doing? What feelings does it appear to have? What type of rudimentary intelligence is it showing? Ask such things, not because they will give you a systematic theory, but because they will help you to form the habit of watching minds. For as teacher you will always be watching minds, yes, watching even more than judging them.

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And the habit of merely judging minds as good or evil, without observing what state it is, what mental coloring, what inner live process, that makes them good or evil; this habit, I say, is so ingrained in most of us that it is always hard to learn to substitute diagnosis for mere estimation, and a loving study of the process for mere external liking or disliking of the person. Yet just such study of the inner process is the larger part of a teacher's theoretical business. And that is why I counsel him to use his psychological reading rather to train his power of diagnosis, than to equip him with abstract pedagogical rules. The teacher who can make out what the child's actual state of mind is, has developed the true sort of psychological insight.

It is easy to illustrate how this attitude of the naturalist is worth training as part of a teacher's equipment. Lubbock, studying his bees and ants and wasps, to find just in what sense they had intelligence, learned no pedagogical principles. But his attitude was at least that of a relatively dispassionate diagnosis. In some fashion he learned to know the minds of his bees and ants, to look at their world as they must look at it. Well, a teacher in presence of a naughty child feels often as hopeless a sense of the remoteness and the mystery of this demoniac sullenness, obstinacy, cruelty, or disobedience, as ever an amateur naturalist may have felt as he looked at the marvelous doings of ants and of bees. We naturally take refuge from such mysteries by refusing to observe the mechanism of their symptoms, and by confining ourselves to mere external judgment. We dislike the naughty child and we tell him so. And up to a certain point this unsympathetic dislike of ours is indeed a useful discipline to the child. It stimulates his native social instincts to work against his morbid or hateful impulses. If he is strong enough to save himself, as he often is, our hatred and punishment set him at work to do so. But then this is but a small part of the humane task of the teacher. The child may not be strong enough to get out of the lonely mental dungeon of his naughtiness. In any case we must help him out if we can. He can't diagnose himself. He

knows not whence comes the demon that torments him, or what power locks him in this prison. We must find out. That he is naughty we know, but what naughtiness is it? Is it, so to speak, cerebral naughtiness, or stomachic naughtiness? Are his bowels out of order, or is it his very strength of body that is here making his brain lustily wayward? So far the diagnosis is relatively a medical one. It becomes more strictly psychological when one has assured one's self that the mysterious cause is, on the whole, in the highest region; that it is "the boy" and not his stomach that is out of order, the brain cortex and not the alimentary canal that is primarily affected. Well, shall we here fall back on the merely external estimate and say, sternly, "So long as you choose to be wicked I can do nothing for you"? Sometimes, indeed, we have to be content with this. But the teacher wants, if possible, to do more. And here it is that he must become a psychologist, not in the systematic, but in the scrutinizing sense; not as scientific generalizer, but as observing naturalist, as collector of mental facts. What is going on in this mind? How does it feel to be naughty in just this way? Is it a case of the true "insistent impulse," or is it a chaos of angrily contending suggestions that come to the child from without? Is it "irritable weakness" of temperament, or is it confusion of head by reason of the manifoldness of the new impressions that are just now assailing the young brain? Or is it mere apathy, mental anæsthesia? Such questions may look technical. We don't ask them very often. When my own children are naughty, I am, alas! seldom in the mood to be psychological. But then, none the less, such questions ought to be asked, and intelligently, too, by the dispassionately scrutinizing teacher. They ought to be answered cautiously, after due time for observation. And the scrutinizing itself ought to be, so far as possible, as cool and as searching as Lubbock's study of the ants and bees or as Preyer's watching of the infantile eyes and fists. For only such examination will give insight, and only such insight will suggest the best means of cure.

As for the cure itself, pedagogical formulas will seldom prove

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sufficient for the case. If you could really get at the mechanism of naughtiness, you would probably see that as no two brains are alike, so no two children are ever naughty in precisely the same way. The diagnosis will, if acute and thorough, be pretty surely in part individual. But if you have understood the case, you will be nearer the cure; and your instincts and your experience will suggest that.

How rare, after all, is this love for mental diagnosis! How seldom do I meet with it! And yet, believe one who has tried the thing, that with all the obscurities and scientific dangers of the undertaking, there are few tasks more richly delightful than is the patient threading-out of the intricacies of a human mind, when once you can win its confidence and get at its secret. At the heart of its mystery there is always such a rich wealth of living ideas, interests, and passions! Its very naughtiness becomes for the careful observer a charming illustration of the many-sidedness of human nature, and for the humane observer a profound lesson as to how to help our fellow-men. You may love or you may hate the person in other relations, or you may even feel little interest one way or another in the ordinary and external aspects of his social life. But his inner soul is such a splendid world of mental symptoms and of living processes! Seldom do we get the chance thus to scrutinize our neighbor's heart. Only at certain times in childhood and in youth, at certain periods of mental weariness or weakness, the puzzled or frightened or suffering soul can thus willingly confide its heart's mystery to the humane observer. It is the teacher's privilege to find many such opportunities. I want him to study psychology in order that he may learn how to use them. And once having used them, he will find all his work strengthened and enlightened by them.

This first method in which theoretical psychology can be of service to the teacher having been disposed of, I can speak very briefly, and only by way of illustration, as I close, of two sorts of inductions in modern psychology which seem to me to have especial pedagogical importance.

1. The growth of the intelligence is subject to certain still very imperfectly formulated laws, which, in a vague and general fashion began to be recognized in the last century, and which have been already much employed for pedagogical purposes. The higher processes of the intelligence are begun, and continually supported throughout our lives, by fitting sensory experiences. Upon a more or less accurate analysis of these, and of the perceptive processes that are dependent on them, has been founded the theory of object-teaching. Herbart's principle, since widely stated and applied, that involuntary attention not only precedes voluntary attention, but should always be employed by the teacher as a basis for the latter whenever that is possible, is another example of a pedagogical use of a psychological induction. This principle is embodied in that whole body of pedagogical doctrine about finding and appealing to a child's actual interest, which, in combination with the doctrine that sense-experience should always be used, when that is possible, as a basis for abstract thinking, and that perceptions must prepare the way for higher apperception, has done so much to revolutionize the practice of the modern teacher. The relation of attention and memory, of interest and retention, has again suggested to teachers a relatively scientific basis for much of their work. These are examples of the direct influence of psychology upon the theory of method. Their importance no one will deny. The imitation of the "science of teaching" in these directions is, however, quickly suggested by the story of the numberless pedagogical "fads" that, on the basis of a hasty assimilation of this or that psychological induction concerning the processes of the intelligence, have lived or are living their day, doomed to an untimely death. Object-teaching, too, has had its absurdities; such recent "fads" again as the proclaiming of "manual training" as the one true way of salvation for our schools, will suggest what happens when the single induction pretends to take the place of the whole science, when the single device tries to crowd out nearly all the rest of the art, when one little idea that is most admirable in its place and

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time, like this very idea of "manual training," assumes a barbarous foreign name to give itself a loftier dignity, and presents itself as the one latest result of "science." Let us study the inductions of psychology; but let us finally anathematize the "fads," and all who trust in them. Science does not counsel individual, unchangeable, and infallible "methods." She corrects our errors; but she also shows that there is no royal road to the true method, which must vary with the particular educational problem that we have to solve. The devices of the pedagogue should take counsel of science; but they should be modest in their pretensions even after they have done so. Not every one who says "Psychology! Psychology!" shall be saved, nor is every deviser of a new fashion of appealing to the involuntary attention of childhood, or of strengthening its apperceptive processes, a prophet. Whenever we come to see that the possible devices of educational method are endlessly numerous, and that scientific psychology criticises but does not create them, while they themselves are the product of the practical experience and art of the educator, this part of our program for the training of teachers will be more wisely carried out than nowadays it often is. Study, then, the psychology of the intelligence, apply it as best you can to your methods of teaching, but beware of the "infallible methods." Such is my advice to teachers in this realm of their work.

2. A still more recent series of psychological inductions is suggested to us by what Dilthey has said of the typical growth of the human character from the chaotic state of the "primitive impulses" to the organized "teleological" unity of mature conduct. I need not dwell upon the general significance of the whole evolutionary point of view in modern psychology. I will venture, by way of illustration, to mention one aspect of it. I refer to the inductions as to the relations between the phenomena of mental growth and those of mental disease. Readers of Preyer will remember the analogies that he draws between the defects of childish speech, and the diseases of language in the adult. The phenomena of the will contain still more interesting analogies. The naughtiness of the child

is indeed very often similar to what would constitute the symptoms of some form of criminal lunacy in the adult. The child shows you at times pathologically insistent impulses, as well as instances of pathological aboulia, or apathy of will, and many volitional derangements, too, of the explosive type, such as the violent outbursts of childish fury and malice in those who, when adults, will show little sign of burdens of this sort. The difference between the childish chaos of impulses and the derangements of mental disease, will usually lie in the fact that the childish defect, as such, is more frequently *merely* chaotic, so that you get what would be individual pathological symptoms in the adult, while you seldom get the whole context of any diseased type, unless, indeed, your child is actually diseased. But the analogy between childish defect and pathological symptoms is interesting; and science is making it constantly more so. I wish, therefore, that teachers who are looking for scientific light as to the care of childhood, would take counsel, more frequently than they yet do, of the more enlightened expositors of modern mental pathology. Once more, the analogy in question must be used with caution, but the study of the nervous patient, who is, after all, in some fashion or other a child, cannot fail to suggest something to the cautious teacher. If it suggests nothing else, it will suggest to him just that humanity in mental diagnosis which the alienists learn to practice, and which unenlightened teachers so seldom possess. Study, then, the psychology of human evolution, and study it, too, in intimate connection with the psychology of mental defect and disease. Notice the analogy, and use the hints that the wise alienist gives as aids in your examination and training of children. Remember that the chaos of unreason in childhood is itself, in some measure, an incapacity of a relatively diseased sort, and that the wise teacher is a sort of physician who is to help the child toward getting that kind of health which we call maturity.

In the foregoing I have tried only to suggest, and, in the most inadequate fashion, to illustrate a very few of the relations

between theoretical study and the teacher's business. To sum it all up in one word: Teaching is an art. Therefore there is indeed no science of education. But what there is, is the world of science furnishing material for the educator to study. If he seeks in that world for exact and universally valid direction, he will fail to get it, and deservedly fail, because science is not there to win anybody's bread, nor yet to furnish short and easy roads to even the noblest callings. But, on the other hand, if the teacher wants aid from the scientific spirit, and counsel from scientific inductions, there stands ready to his hand such assistance as, above all, psychology has to offer to the educator who desires to become a loving observer of the minds of children, and such assistance, too, as ethics may suggest to the man who is strong enough to grapple with deeper problems. I have had no space to give a fair account of what either of these departments can offer to the teacher. Perhaps my one or two illustrations may serve to indicate my purpose.

JOSIAH ROYCE.

HARVARD UNIVERSITY,
CAMBRIDGE, MASS.

III.

TIME AND AGE IN RELATION TO THE COLLEGE CURRICULUM.

The system of collegiate education in the eastern states of America came mostly as the Kingdom of Heaven comes, without observation. While it was forming no one knew, and no one can, with any exactness or certainty, tell now, whence or how it originated. Its growth was spontaneous and silent rather than the product of deliberation and discussion. But the age of still evolution in this sphere of culture is past. In common with many other institutions and phases of our civilization, collegiate education is now emerging from an automatic into a reasoned and conscious life. All friends of education should rejoice at the change, giving thanks to those enterprising thinkers who have in recent years done so much to rouse the administrators of our highest educational institutions from their dogmatic slumbers. Movements in the interest of educational progress must be welcomed, but they must also be keenly scrutinized. Compared with automatism, which is safe because dead, consciousness is in certain ways dangerous. Yet advance to-day requires conscious action, and we must do our best to assuage whatever friction this may occasion.

Would the shortening of the collegiate course for the degree of Bachelor of Arts be a step in advance? I cannot think so. It seems to me, on the contrary, that all the advantages which that change could possibly bring may be secured otherwise, while the abbreviation of the course in college must certainly entail extreme loss in various ways. Many seem to be influenced in favor of lessened collegiate requirements for the first degree, by the example of the British universities. Touching this, two considerations are of weight. One is that it is highly questionable whether severer conditions for the degree would not be advantageous even there. Great Britain has till recently been as little distinguished as the United States for

study of educational theory and practice. The question what the Bachelor's degree ought to presuppose is as open there as here. The other fact which should deter us from hastily following British precedent on the point at issue is that an undergraduate course of but twenty-seven months[1] is in any event safer in Great Britain than it would be among us, owing to the superiority there of secondary teachers and schools, and the broader range of opportunities for high culture enjoyed by British youth who frequent the universities. The representative British lad of sixteen who aspires to learning has come under a great multitude of educational and cultivating influences which the young American of the same years either has not felt at all or has felt in a far feebler way. The British boy has read more and better books, magazines, and papers than the American. He has heard abler preaching. He has met more foreigners, more men of learning and culture. He is better acquainted with art. If he has not traveled more miles, which is probably the case, he has almost certainly done, if I may express it so, a greater amount of effective traveling. There is in most of the British towns and cities an atmosphere of culture and a sympathy with high studies, which are, to say the least, very rare in America. Scholarship has there a sweep, an intensity, a pervasiveness, and a thoroughness, which unfortunately we have not yet attained, and which long courses of study in college will, better than anything else, help to extend.

Quite as surely misled are we if we clip our college course to match that of the Gymnasium or the Lycée. This for the strong reasons, among others, that we as yet have in America neither the power which is available abroad to co-ordinate college curricula with the studies which precede, nor the means at command in European lands to tempt young men into university work after twenty-seven months of preparation, nor the resources of Europe for profitable university study to offer to such as can and will engage in this.

[1] A three years' course, omitting the long vacations. The regular four years' course commonly involves but about thirty-six months of actual attendance.

So far as appears, the pressure for a shortened course in college comes mostly from the authorities of schools for medical and legal training. Very few people primarily interested in liberal education as such, are in favor of it. Theological professors strongly desire the liberal course to be at least of its present length and severity. No doubt it would be many-wise advantageous could the professional schools begin with our graduates at a somewhat lower age, provided the preparation for professional study were as good as now. It is much to be hoped that a decided reduction in the age of students in professional schools may in time come to pass; but it would be a grave misfortune to bring this about by a mechanical and arbitrary shortening of college time.

The common opinion that the usual age of college graduates in New England is increasing, I consider an error. The average age naturally advanced somewhat when, a few years ago, the requirements for admission to the freshman class were made severer. An average of the ages of the men in a college class is very deceptive, as, indeed, all averages are unless accompanied by information showing how they are composed. Not seldom a class has a high average age, but a very low usual age, the average being raised by the presence in the class of a few men twenty-eight or thirty years old, a phenomenon of frequent occurrence now; much more frequent than half a century ago.

Compare a class of 50 men, having an average age of 20 years at graduation, with a class of 48 men who average 20, and 2 more each 30 years old. The latter class will present an average age of 20.4 years. A class of 30, of whom 28 average 20 years, and 2 are men of 30, has an average age of nearly 20.7 years. These figures show that one learns very little of value about the question of age in relation to a college class by simply ascertaining their average age. My belief is that if the average age of New England college students at graduation is rising, it is due simply to the fact that through wider interest in education and improved facilities for traveling, we are drawing from the rural districts of the East, and from the

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AGE OF STUDENTS WHO ENTERED THE FRESHMAN CLASS OF BROWN UNIVERSITY, 1827 TO 1890 INCLUSIVE.

Prepared by PROFESSOR N. F. DAVIS.

YEAR.	NUMBER ENTERING.	AVERAGE AGE.	AVERAGE BY 5-YEAR PERIODS.	OVER 30 YEARS OF AGE.	OVER 25 YEARS OF AGE.	PERCENTAGE OVER 30.	PERCENTAGE BY 5-YEAR PERIODS.
1827	25	17.4		6	0	24	
1828	34	17.3		9	0	26	
1829	30	18.4	17.7	10	1	33	27.8
1830	38	17.7		0	0	24	
1831	43	19.2		17	3	40	
1832	51	19.4		23	2	45	
1833	61	19.3	18.9	32	3	52	39.0
1834	64	18.3		19	1	30	
1835	68	18.1		19	1	28	
1836	59	18.0		16	0	27	
1837	60	19.0		18	3	30	
1838	70	18.7	18.8	26	4	37	35.0
1839	48	19.2		20	1	42	
1840	49	19.0		19	6	39	
1841	49	19.6		23	2	47	
1842	59	18.4		16	2	28	
1843	45	19.1	19.0	17	3	38	38.4
1844	56	19.2		25	2	45	
1845	38	18.6		13	1	34	
1846	44	18.8		13	1	30	
1847	48	18.6		16	1	33	
1848	48	18.0	18.4	14	1	29	28.6
1849	48	18.0		10	2	21	
1850	89	18.6		27	1	30	
1851	92	18.5		29	1	31	
1852	103	18.7		30	4	29	
1853	92	17.9	18.7	32	4	35	34.6
1854	80	19.3		34	7	42	
1855	81	19.2		29	7	36	
1856	70	19.2		25	5	36	
1857	69	18.3		14	2	20	
1858	65	18.4	18 7	15	2	23	31.4
1859	86	19.1		35	3	41	
1860	82	18.4		30	1	37	
1861	62	19.5		25	2	40	
1862	57	19.0		19	4	33	
1863	53	18.4	18.9	11	2	21	29.4
1864	57	18.7		14	2	25	
1865	58	19.0		16	5	28	
1866	78	18.9		22	5	30	
1867	51	18.9		15	2	30	
1868	58	18.5	18.9	16	0	28	31
1869	62	18.9		20	3	32	
1870	90	19.1		30	3	33	
1871	59	19.0		18	2	31	
1872	59	18.4		15	0	25	
1873	69	18.5	18.8	19	1	28	30.4
1874	86	18.8		25	2	29	
1875	64	19.4		25	2	39	
1876	74	19.0		27	2	36	
1877	55	19.1		18	1	33	
1878	77	18.7	19.0	22	2	24	36
1879	79	18.9		22	2	28	
1880	77	19.5		36	2	47	
1881	76	19.3		24	3	32	
1882	87	19 5		33	3	38	
1883	59	19.1	19.4	25	1	42	36.2
1884	63	19.0		22	1	35	
1885	76	19.9		26	7*	34	
1886	77	19 4		27	2	35	
1887	74	19 0		18	2	24	
1888	64	18.9	19.2	14	1	22	26.6
1889	75	19.1		18	0	24	
1890	95	19.7		36	6†	38	

* Two over 32 years.
† One 32 years.

West a larger number of young men, teachers and others, whose age far exceeds the average. Unless I greatly err, the usual age of the youth in the eastern colleges is falling, and is destined to fall more and more, though the requirements for the baccalaureate degree remain as now.

But the main trouble at this point does not pertain to the college course, and cannot be properly cured by any change, temporal or other, in that. It lies in the earlier stages of education. Thorough explanation of it would lead to a criticism of all our primary and grammar-school work. The fact is that owing to the insufficient remuneration of teachers in our lower schools, and to the too slight honor paid to the profes-

AGE OF STUDENTS WHO ENTERED THE FRESHMAN CLASS OF HARVARD COLLEGE 1856–1890, INCLUSIVE.

From Report of a Special Committee, October 8, 1890, to the Board of Overseers.

Year	14–15	15–16	16–17	17–18	18–19	19–20	20–21	21–22	22–23	23–24	24–25	25–26	26–27	27–28	28–29	29–30	30–31	32–33	44–46	Average Age	No. adm'd
1856	4	16	44	34	29	7	1	4		3		2								17 yrs. 7 3/12 mos.	144
1857		6	31	27	25	8	3	3		5										17 " 11 1/12 "	108
1858		7	23	43	30	11	3	2	2	3										17 " 11 9/12 "	124
1859		6	26	56	31	14	5	3	1	1	1									17 " 11 "	144
1860		9	26	38	33	14	9	1	4	2										18 " 1 1/12 "	136
1861		3	24	50	23	13	3	5	1	2			1		1					18 " 1 1/12 "	126
1862		2	19	41	30	15	10	3	2				1							18 " 3 7/12 "	123
1863	1	2	22	38	36	13	5	7		2			1		1					18 " 4 2/12 "	128
1864	1		14	30	18	19	6	3	1	2	1				1	1				18 " 9 1/12 "	97
1865		5	19	51	28	23	9	1	5		1		1							18 " 3 7/12 "	143
1866		6	19	38	46	23	8		3	1										18 " 2 1/12 "	144
1867			22	56	55	24	7	9	3	1	1									18 " 5 2/12 "	178
1868			16	48	37	22	13	2	1	2										18 " 5 1/12 "	141
1869		2	15	49	52	22	11	6						1	1					18 " 5 2/12 "	159
1870		3	19	76	53	29	11	4	4	1	1			1						18 " 4 2/12 "	203
1871		6	24	59	62	28	16	4	1	1										18 " 3 2/12 "	201
1872		2	20	51	65	29	12	4	2	1				1						18 " 5 7/12 "	188
1873	1	2	19	52	76	43	17	11	3	4	2	5		1						18 " 10 2/12 "	236
1874	1	2	19	61	58	42	7	4	1	2	2	2		1						18 " 6 2/12 "	202
1875	1	1	12	78	93	49	10	7	3	4										18 " 6 2/12 "	258
1876		1	12	58	60	53	20	7	2	2	1		1							18 " 9 "	217
1877		2	16	52	80	53	23	9	6	3	1									18 " 9 2/12 "	245
1878		2	14	52	78	45	22	7	9		1									18 " 9 1/12 "	230
1879		1	16	49	86	53	19	15	4	1	1	1	1	1						18 " 11 "	248
					18–18½ 18½–19																
1880		1	12	52	40 44	53	24	9	3	4	1	2	1	1						18 " 11 2/12 "	247
1881		3	10	38	29 44	55	31	10	8	1	1							1		19 "	230
1882	1	3	11	58	36 53	60	28	12	4	5	1	2				1				19 "	275
1883			17	65	56 44	61	23	7	7	2	2	1								18 " 9 1/2 "	285
1884	1		12	63	65 25	72	29	8	4	1	5	1								18 " 10 2/12 "	286
1885	2		10	63	47 42	56	40	6	4	4	1	2				1	1	1	1	19 " 1 2/12 "	281
1886		4	14	64	65 51	67	29	12	3	3	2	1	2	2			2			18 " 11 3/12 "	321
1887			8	71	61 45	89	26	7	9	2	2	3	3				1		1	19 " 1 2/12 "	328
1888			13	57	65 50	66	31	14	5	3	4	1	1	1			1			19 " 1/2 "	312
1889		1	14	63	58 54	82	24	5	3	4	3	1		2	1			1		19 "	316
1890			9	55	59 63	87	29	14	1	3	2	1								18 " 11 1/2 "	323
	13	98	621	1836	2280	1400	564	225	109	75	37	25	13	12	5	3	5	3	2		

NOTE.—Each student is counted only once in this table and in the year in which he originally entered. All ages are calculated as of October 1 of the freshman year of the class in which the student entered. The last four years (classes now in college) are necessarily incomplete, but are correct to date.

sion by Americans, the teaching in most of our lower schools is very poor compared with the corresponding service in Germany and France. This has been clearly and frequently pointed out of late years. We are lamentably behind in inculcating the elements of science. Much that the pupil should begin at twelve or fourteen, we postpone until his sharpest observational power is gone forever. Often his condition is even worse than this. He has contracted habits of inattention which no amount of effort at a later time, when he is in college, can ever overcome. Our methods in language are nearly as bad. Youths of seventeen should, and easily could, were they only taught with due system and ability, know as much Latin and Greek as now, besides having a first-rate reading and speaking knowledge of Italian, French, and German. It is a wicked waste of time and effort that students who already know Latin are made to learn French without utilizing the natural bridge from the Latin to the French language which is furnished by the Italian.

Great progress is still to be made in teaching the accidence of the Greek and Latin tongues. Very much more grammatical detail is insisted upon than need be touched at all, a great deal of it being certain to be picked up as needed in the course of that copious reading which should be insisted upon at the earliest possible moment; while many rules of all sorts are painfully and laboriously taught in most of our schools, that are of no use whatever at any period, save as a training to the memory through the work of learning them.

Now when the economy which we are certain to attain in these various particulars has been secured, we shall, I believe, save to the average college graduate at least one year of the time which he now spends upon his education, and probably two. This will remove the evil of which many who are interested in professional schools complain, and it will effect the remedy in a perfectly natural and helpful manner. Those students who then advance to graduate work of any kind will have an enviable preparation for the professional schools, which therefore cannot but be better off than by a process of

multiplying their pupils through a reduction in the time now devoted to collegiate work. Young men will thus gain in mental power as well as in opportunities. I do not share the view that college students need to be as old as they now average in order to receive the full benefit of their severer studies. Proficiency in these, within large limits, has little to do with age, and is not, as a rule, greatest in the oldest pupils. Proper teaching in the lower grades will send to college better thinkers as well as better linguists and writers.

To all this it will doubtless be replied at once, that the plan of reducing the collegiate course has anticipated these improvements which are to come in preparatory teaching; is indeed, in large degree based upon that anticipation for its justification. It will be said, in other words, that when the betterment has been brought about, although the collegiate course should then be but twenty-seven months in length, the pupil's entire education will be quite as good as now and even better. That is possible, but I do not for my part admit that thirty-six months would be too long a time to spend in college, even were the teaching in the lower grades the best possible. The proficiency required for the lowest degree in Arts is much more important than appears at first sight. It is very influential in determining the standard of a liberal education and even of general intelligence for the nation. It should involve too much rather than too little. The curse of our time, so far as liberal education is concerned, is early specializing. We have innumerable well-trained graduates from all the technical and professional schools—physicians, lawyers, clergymen; while among those who have not yet entered the advanced schools, or perhaps do not expect to do so, are to be found many more scholars of rare merit in this, that, or the other particular field. You need not search long for a brilliant psychologist, a fine Hebraist, a specialist in Greek, German, Sanskrit, or general philology. Trained specialists in every department of science are at hand. But if one seeks a scholar, a well-rounded thinker, a man of generous and broad mental sympathies, the search is a long one. I believe that

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any one who has been charged with the work of hunting up fit occupants of professorial chairs feels that what our part of the educational world needs is not so much special attainment, which it is extraordinarily easy to furnish, but broad, deep, rounded, masterful intellectual culture. If the scholarship of the nation is to be maintained we must have more of this. Even the particular sciences themselves suffer from the undue relative prevalence of special study. Who can look back over the long conflict between science and religion as commonly understood, without being impressed that the entire difficulty has arisen from the inability of either side to appreciate the truth held by the other? This myopia has its source in immature specializing. Religious teachers have for the most part known nothing of science, while the champions of science who have had the most to do in giving trend to scientific thought have been men who have hardly read a page in theology or philosophy. If this quarrel is unique in its proportions, it is typical in its character.

Now it is during the pupil's collegiate years that this all-important widening of the mind's horizon, this precious enlargement of the intellectual sympathies, takes place. How often is one pained, following youth from college into their professional studies, to find the range of their sympathies narrowing as their mastery of new subjects increases! The influences under which they have come sharpen the mind, but are not helpful to greatness of thought. They are not intended to be.

In this respect again, we are at a disadvantage compared with Europe. There, professional and technical courses are made much broader than here. The intending lawyer devotes years to studies in the history of Roman Law. As he ranges the Pandects and the *Corpus Juris* he is acquainting himself in the best possible manner with the history of Roman and mediæval civilization. The instruction in ecclesiastical and doctrinal history given in most of the theological schools of this country is in no wise so broad or cultivating as the corresponding study beyond the ocean. Foreign medical students

are treated to elaborate general discussions in the various realms of science where their studies lie, in a way that is exceedingly rare here, if it be found at all.

Nor can we safely forget that the need of wide and constructive intelligence must become more and more intense as our life increases in complexity. The standard liberal education, far from lessening in its scope and range, should increase. To possess universal sympathies, to provide one's self with eyes looking every way, each one telescopic, demands a larger and larger outlay of time and pains as the years pass. Professional schools are not fitted to impart this.

If, however, we were to agree that a pupil should end his collegiate life with only the amount of training which he would secure by a first-class preparatory course, capped by another of twenty-seven months in college, I should say that the proper place to curtail is not the college, but the preparatory school. There will not in half a century be many high schools or academies in our country which can give to their advanced classes so good advantages as those which are afforded to freshmen by the New England colleges at the present moment. There are many reasons for this. One is that, save in the few amply equipped schools, the teaching will never be as good. Another and weightier reason is that a high school or an academy is not and never will be a college. The American college is, as a factory of intellect, *sui generis*. The mental activity in even the poorest of our old collegiate institutions is something as incalculably valuable as it is peculiar and difficult to describe.

College teaching always tends to be wholesomely liberal. If from the point of view of technical pedagogics it is no better than that which precedes, it is usually far richer in effect, because pitched to a higher key, and carried on with a larger thought of the ends and aims to be compassed by it. More than this, class-room work, while furnishing a great part of the pupil's discipline during his school years, is far from giving it all. Much comes from the traditions and the atmosphere of the seat of learning. The attrition of pupil with

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pupil, the association with each other of young men from different states and countries, from all sorts of homes, of diverse environments throughout their earlier years, of various grades of culture, of conflicting religions and religious sects,—all this is highly beneficial. Invaluable, too, is the influence exerted outside the class-room by the instructors whom the student sees about him in college, a subtle power bewitching him like a charm from the moment of his matriculation. Great libraries, museums, observatories, and laboratories, distinguished men who visit the college from time to time, and occasional contact with advanced students pursuing original investigation, all operate in the same inspiring way. Of this kind of help to a higher life, young men cannot have too much; and while both lower and higher seminaries of learning communicate it to a certain extent, the chief fountain of it, for this land, is the college. I should therefore unhesitatingly prefer that the young man who has studied a certain number of terms and is now about to go out into life, or to enter some professional school, should have had thirty-six months of his preparation in college rather than twenty-seven months in college and an additional year in some different institution.

Many would, I have no doubt, concur in this view, but would say that, desirable as its realization might be, it is still best, on the whole, to reduce college study in years or months, because of the larger number of young men who can then be induced to take a collegiate course. Grant, it may be said, that the Bachelor's degree after the reduction will be less worthful than now, that it will imply less discipline, less culture, less mental power in general, yet the good done by colleges to the rising generation, to the country, and to the world, would be greater after the change than now, because the advantages, though inferior, would then be shared by a much greater number. Were it certain that any considerable increase in the number of the young people resorting to the colleges of our country would follow an abridgment of the college course, I should greatly incline to favor the change. But I do not believe that such a result is even probable. It is

at best far from certain. There is even ground for fear that the outcome might be the reverse. The policy of reduction could easily be construed as an admission on the part of its friends that collegiate education was of little worth, thus multiplying the numbers of those passing directly from preparatory to professional schools. The problem is one which no statistics can solve; on which, in fact, we have few clear data of any kind. I have given it much thought, and my conclusion is as just stated. I am persuaded that from my own college, at any rate, the length of the course excludes none or very few. The young men who mention this as a bar to entrance are almost always influenced by other considerations. The older never plead it. It is suggested by poor scholars whose presence in college is of doubtful advantage anyway. The students who drop out of our classes are not the oldest, and are never, except such as leave on account of ill health, the best. They are the men of feeble will power and intellectuality; most of them go either during the freshman year or at its close. Hardly one ever gives up at the end of junior year, and I do not think that one per cent. of our students who conclude that year would feel it to be other than an irreparable loss to end their course there.

The facts at the University of Michigan tally exactly with those at Brown University. The academic faculty at Ann Arbor have of late been gathering data which bear on this part of our problem in a very interesting way. They find by actual statistics that a much smaller proportion of their candidates for degrees than they had supposed relinquish their courses before graduation to enter the professional departments. Nearly all the men who there pass from the academic department to the schools of medicine and law are men who have taken the full course, and that, too, men who have elected and pursued classical studies, involving the maximum of time in preparatory schools. This noble institution permits certain studies to count at once toward a liberal and a professional degree, an ordinance to which there is no objection so long as only liberal studies are permitted to play the double rôle.

The numerical diminution of American college students in proportion to our population, though doubtless a painful, is not an alarming symptom. There is hope that its causes will prove to be of a temporary nature, and that in time the tide will turn. The relative falling off in college attendance springs, as I judge, mainly from four facts: (1) the materialistic temper, with its desperate appetite and quest for wealth, which has fastened upon the American people since the civil war; (2) the increased cost of attending college; (3) the former narrowness of college curricula, and (4) the pedantry in college teaching which has till recently been so common. But each of these bids fair to be in future less and less a source of loss. The second evil may be much assuaged, though to cure it is perhaps impossible. The last two, the colleges can remedy at their option, and they are rapidly doing so.

We do not with the Pythagoreans ascribe any magical or moral quality to the number four when we say that four years is as little time as will suffice to give a liberal, non-specialized training. For such a purpose, thirty-six months of actual work have a value surpassing that of twenty-seven months by very much more than a third. A good curriculum is no chance lump or slice from a homogeneous mass of educative material, all whose units are equally precious. It must be a thing, with its own entelechy, having shape, individuality, character.

As heartily as any one can do I congratulate the friends of education upon the decadence of the fixed college curriculum. It forbade thoroughness, and quenched instead of utilizing that enthusiasm with which most pupils can be led to work. But at least equally great would be our error were we to fly to the other extreme, extruding from the course pursued by our students all elements of articulateness and unity. If it is inadmissible to say that sound and broad mental power can be acquired only by the mastery of five or six branches pursued in a rigid order, it is certainly no less so to lay it down that any study is as valuable for discipline as any other, and that the order in which we teach them is wholly immaterial. We

might set classes at the empirical study of permutations and combinations. It would be mental work, not without valuable results in continuity and accuracy of thought. Moreover, the field is infinite. Yet a teacher who should insist upon feeding his pupils with that chaff would deserve capital punishment. There is a distinction of better and worse between branches of study in reference to their fitness to be pursued in college. Further, among those matters which are suitable to be taught, there are some which should of right receive the pupil's attention earlier than others. First ought to come the disciplines calculated to build up the power for steady, methodical and long-sustained mental exertion. Next, filling the middle half or two thirds of the course, you may well crowd in, for election by different pupils, according to their preferences, all the natural sciences, mathematics, phases of history, sociology, philosophy, literature, and religion, for which teachers are at hand. And last, crowning, unifying, and vivifying all, should come a good deal of specially hard drill in the science of mind. Some such arrangement of studies as this, articulate without rigidity, compelling effort and repelling gross idiosyncracy while nursing individuality, will be found educative far beyond either an iron curriculum on the one hand or mere *laissez faire* intellectual browsing on the other. Now and then, to be sure, is encountered a young man who, owing to some mental peculiarity, would best not conform at all closely to any program of this sort, but he will find his nonconformity a misfortune, a cause of weakness. Now my conclusion is this: Twenty-seven months is too little time to admit of putting due system into a liberal curriculum. Without more, you inevitably slight either the disciplinary portion at the outset, or the liberal and nutritious part in the middle, or the unifying mastery at the end. Twenty-seven months would suffice better had our college faculties, like those of the German Gymnasia, the power to shape into one whole the preparatory and the higher studies. As we are barred from this, we need longer time.

Should it be decided, after all, that the true fortunes of

higher education in New England and the East would be best subserved by shortening the course for the degree of Bachelor of Arts, this certainly would not be the case further west, and we are bound to plan for the best interests of education the country over. The colleges and universities in the central and western states are doing a work of incalculable advantage to this nation and to the world. From the nature of the society by which they are surrounded, it is impossible for them to maintain quite as high a standard as prevails in New England. If we reduce the time, they will perforce reduce; whereas, beyond question, the desirable thing for them is rather that their courses should be extended.

While the requirement for the Bachelor of Arts degree, setting as it does the standard of good letters for the land, should not be lowered, it is desirable that college doors should stand open to welcome any and all competent students for whom circumstances or inclinations prescribe shorter courses.

I strongly favor university extension, *infra* as well as *extra fores*. I would have as many "short cut" courses as could well be made up, giving the pupil a degree on the completion of each; and I would, beyond this, use all means to bring into the college fit persons, who could or would attend to but a single study for a single term. We might thus multiply our college population without lowering our standard.

E. Benjamin Andrews.

Brown University,
Providence, R. I.

IV.

HEREDITY AND EDUCATION.

Among the great facts which have come to the front during the last half-century, heredity is perhaps the most prominent. It has been recognized in all ages. It never was more clearly stated than in the Ten Commandments: "For I the Lord thy God am a jealous God, visiting the iniquity of the fathers upon the children, upon the third and upon the fourth generation of them that hate me; and shewing mercy unto a thousand generations of them that love me and keep my commandments." This fact, as science interprets it, shows that it is the tendency of disease and evil to run to the third and fourth generations, seldom to the fifth, and that then there is reversal to the original type, which is always beautiful and beneficent. On the other hand, in the nature of things, that which is good continues so until corrupted. Evolution has unquestionably brought the law into its present prominent place; for evolution works by two factors, namely, heredity, or that which tends to permanence; and environment, or that which tends to variation. The characteristic of the first is that it reproduces the past; of the second, that it adapts to new conditions that which has come from the past. The prominence of these forces is, whether justly or not, revolutionizing thinking, compelling men to rewrite their psychologies, their treatises on ethics, their theological creeds. While the revival of interest in this great law influences other spheres of inquiry, it would be strange if it did not also modify theories of education. To some extent it has probably done so, and yet in this department, where its influence ought to be first and most imperatively felt, it has been slowest in asserting itself.

Heredity is that factor in the progressive development of the race, or in the history of humanity, which preserves and trans-

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mits from one generation to another that which had previous existence. In this study, the reality and constancy of the law of heredity is assumed. To contradict it is to deny the facts of nature, and to discredit the daily witness of our senses. Only concerning its minor manifestations is there doubt. The heredity of race characteristics is not questioned; animal kingdoms never cross; Africans always give birth to Africans, and a Yankee was never yet born of full-blooded Chinese parents. Moral, physical, and intellectual characteristics are transmitted either from parents to children, or, by atavism, skipping one or more generations. Of course these characteristics are modified, for no child is the product of one parent or of one stream of heredity alone.

Is heredity an irresistible force? Must that which is potential inevitably manifest itself? Here we face another fact which must be assumed, one which is too evident to be doubted. Heredity is constantly modified by environment. In a vacuum, rock would remain rock forever; but heat, moisture, frost, pelting rain and driving wind gradually destroy, not the rock itself, but the form in which it existed. A dweller in the lowlands of South Africa is indolent; life calls for no struggle; he is little better than the swine, and his descendants are like himself. That man is transplanted to the high Andes; he breathes rarified air, his lungs move quickly and inhale vast amounts of it. He dies, but his children are better adapted to these conditions than he, and their physical constitution is slightly different; the chest is expanded; the lungs are more fully developed; and so on through the generations. Thus the descendants of South Africans were developed into the Incas, the dominant race of the ancient Peruvians at the time of the Spanish Conquest. Heredity preserved the race-characteristic, but new conditions made a new constitution. Now we assume that the influence of environment on the whole man is the same as on the physical nature. It always tends to adjust to the circumstances of the present that which has come from the past. "When the organization is not structurally modified, as in idiocy or insanity, or organi-

cally weak, and where conduct depends on knowledge of moral obligation, environment is stronger than heredity."[1]

Every child is the product of all preceding generations. He is not himself alone, but a body packed with potencies derived from no one knows how many or what personalities which have lived before him. The problem of education is by means of environment to modify and, as far as possible, destroy the evil, and bring the good into expression and power. Nor is this all; for tendencies to good, when improperly balanced, become evil. Education, therefore, has to do with the elimination of tendencies toward deterioration and the proper development and balancing of tendencies toward good. The word education is a history. It implies heredity, for it indicates something to be drawn out; and as that something could not originate with the child, it must have been transmitted. The word implies powers which have come from others and which are to be trained. So of the word culture. Where does culture begin? With birth. The age of impression is quite as important as the age of reason. But culture implies something to cultivate. That something is not implanted by teachers, but is always inborn. This is clearly recognized by the three authors who in our time have written most helpfully on this subject. Emerson's teaching is as follows: "A man is the prisoner of his power. Powers of individuals are poorly balanced. A topical memory makes him an almanac; a talent for debate, a disputant; skill to get money makes him a miser, that is, a beggar. Culture reduces these inflammations by invoking the aid of other powers against the dominant talent, and by appealing to the rank of powers." He says also, "Culture cannot begin too early. . . . . I find, too, that the chance for appreciation is much increased by being the son of an appreciator and that these boys who grow up are caught not only years too late, but two or three births too late, to make the best scholars of." He says again, "The end of culture is to train away all impediments and mixture and leave nothing but pure power."

[1] Dugdale, *The Jukes*, p. 65.

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On the same subject Matthew Arnold quotes Montesquieu as follows: "The first motive which ought to impel us to study is the desire to augment the excellence of our nature and to render an intelligent being yet more intelligent." Again he says that culture is "an inward and spiritual activity having for its characters increased sweetness, increased light, increased life, increased sympathy." Principal Shairp's idea of the end to be reached is not different. He quotes approvingly the words of Leighton: "The only sufficient object for a man must be something which adds to and perfects his nature." The difference between Emerson and Arnold on the one side, and Shairp and his school on the other, is not in the idea of what education is to do, but in the means to be used. All agree that education is the process by which inherent powers are to reach their highest and finest growths. But how vastly the practice belies the theory. In most schools there is almost total neglect of what ought to be the fundamental principle in education. Instead of being a process for drawing out and developing to its full that which is best, instead of seeking to eliminate the evil and prevent any power from having a droning preponderance in the scale, our education, from beginning to end, (1) ignores the necessary differences in children, treating all as if they had the same heredity and surroundings; and (2) instead of making its business the bringing out of something inborn, it makes it exactly the reverse—a process of implanting, without thought of adaptation to the soil.

All schemes of culture should begin with the recognition that each child is different from every other; that the lines of difference run far back, and therefore are not superficial, and that, in order to secure the highest efficiency, systems of education should be adapted to the individuals to be reached. Each child possesses characteristics which run back through generations, for which it is not responsible, and which can be changed only by the most carefully planned and wisely adjusted discipline. In each pupil there appear tendencies which have been modified here and given new impulse

there, tendencies which are sometimes quickly discerned and sometimes lie too deep to be easily found. Two illustrations will develop my meaning. A few years ago when addressing the children in the Newark City Home at Verona, N. J., my attention was attracted by two boys occupying the seat directly in front of me. One was thin and pale, his fingers were long and slim, his eyes blue, his hair light, his cheeks sunken. There was little of the animal in him, little of anything, apparently, but sensitiveness. His seat-mate was his opposite in every respect. His hair was black and stood on end as if electric, his eyes burned like coals, his mouth and chin resembled those of a bull-dog, his face was florid; he was evidently full of animalism and passion. Those two boys were what they were by nature. They had probably come from the same sphere in society. No circumstance but blood made the difference between them. They were products of different lines of heredity. Could they, for the best results, be reached by exactly the same process of education? Consider now an illustration from widely separated grades of society. In a certain school was a young lady, a daughter of New England parents, both of them of fine culture and exquisite taste, well qualified to direct her study and to stimulate her aspirations. Everything that sympathy, congenial taste, opportunity, could do for them had been done, and they in turn were handing the same blessings to their child. In the same community and school was the daughter of a laborer; her home gave her absolutely no help; her father and mother had both wandered far from righteous lives. This girl was surrounded by ignorance and wickedness, and had especially strong tendencies toward degeneration in her blood. But her associations in the community developed aspirations never helped by those who were nearest of kin. Her tendencies were toward indolence, neglect, and something worse; her aspirations were few and were stimulated outside her family. Here are two typical cases: one girl with blood and home in her favor; the other with neither, but still with possibilities which may be developed. The two come to our public or private schools,

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and are treated exactly alike; they are given the same books, the same things are presumed to interest, the same ability is supposed, the same tasks are required, and they are judged by the same standards. If there is any such thing as a science of education, do we catch sight of it here? In ten years those two persons may occupy the same relative positions; they may be equally cultured and respectable; but it will never be by using the same methods for both.

If, now, it be granted that heredity and environment differentiate the pupils in our schools so that no two, even from the same family, are exactly alike; and that they come to the teacher's hands each with his own peculiar powers and faculties to be developed, the problem of education becomes complicated and difficult.

By the study of what men are, we learn of what they are capable. The word education signifies, "To lead out." To lead out what? That which is in the book? No. That which is in the teacher's mind? No. That which is in the pupil. Dr. Stanley Hall says: "There is one thing in nature, and one alone, fit to inspire all true men and women with more awe and reverence than Kant's starry heavens, and that is the soul and body of the healthy young child. Heredity has freighted it with all the results of parental well and ill-doing, and filled it with reverberations from a past more vast than science can explore; and on its right development depends the entire future of civilization two or three decades hence. Simple as childhood seems, there is nothing harder to know; and responsive as it is to every influence about it, nothing is harder to guide. To develop childhood to virtue, power, and due freedom is the supreme end of education, to which everything else must be subordinated as means. Just as to command inanimate nature we must constantly study, love, and obey her, so to control child-nature we must first and perhaps still more piously study, love, obey it. The best of us have far more to learn from children than we can ever hope to teach them; and what we succeed in teaching, at least beyond the merest rudiments, will always be proportionate to

the knowledge we have the wit to get from and about them."[2] "To develop childhood to virtue, power, and due freedom is the supreme end of education, to which everything else must be subordinated as means," is a true definition of education. A secondary object is the acquisition of knowledge, but even this is subsidiary. Knowledge is not always desirable for its own sake. It is valuable as a means. Study which leaves the manhood narrow and contracted, and fills the head only as gold fills a miser's purse, is not worth the effort required.

When this ideal system is contrasted with the systems in common, if not universal, use, what do we find? I hope I shall not be understood as blaming teachers for what belongs at the door of the system in which they are compelled to work. Is it not true that little, if any attention is given to the systematic study of child-life? Is it not true that in most of our schools the supreme duty is to go through certain text-books in the time allotted? So much Cæsar must be read, so many pages of history and of arithmetic must be completed this term. Why? Is the end of education to cram a child with Latin and history and arithmetic? Is it not better that one example should be thoroughly and completely understood than that forty should be worked mechanically, and perhaps accidentally? What common sense is there in a rigid rule that a certain number of pages shall be traversed, if discipline and the balancing of faculties is the end of education? What knowledge of child-life, what adaptation to peculiarities is displayed in such a system? I look back to many of the schools I attended in my own childhood with unlimited disgust. I was not taught. I was put into a procession and marched through so many years of school-life, and then let out. I never liked mathematics, but to this day I believe the aversion could have been overcome by a few hours' patient, careful training, with no step taken until the reason for it was understood. Furthermore, if the study was worthy of pursuit, then, simply because of my natural antipathy, it should have been taught with more thoroughness and patience than those studies in

[2] In the *North American Review*, February, 1885, p. 146.

which I rejoiced. Here, for instance, is a child who has never known anything about home discipline, and has had nothing to awaken aspiration; his education is not completed until he has learned obedience and his eyes have been opened to higher things. The child who is all imagination should, by proper methods, be brought to understand that he is human; and I know no better way to teach a boy that he is not to live by imagination alone than to set him to the study of mathematics. On the other hand, the pupil who is commonplace and prosaic should have his life illuminated and expanded by familiarity with imaginative literature, especially poetry.

Place for spontaneity should be left in all systems of education. Genius flowers in most unexpected places. Not always do children of fine and quick aptitudes come from homes of culture. Even log-cabins have produced their Lincoln and Garfield. But the teacher with his eyes on the child-life, rather than on so many pages of arithmetic or geography, will detect the unique child as soon as he appears, and adapt his methods accordingly.

But let us put the blame of this condition of things where it belongs. I once stated my views on this subject to a distinguished educator. He replied: "I agree with you perfectly, but what can I do? It is my duty to examine teachers, but my hands are so tied that I can do nothing." I said, "Is it not often true that a teacher who may be an expert in reading children and in adapting to them the instruction they most need, could not pass your examinations?" He replied: "Undoubtedly, and I am disgusted with the whole system." Not long ago, in the company of several teachers, I asked how many had ever had attention called to the duty of discriminating among their pupils as to natural powers and faculties. All but one replied that it was a neglected topic, and that one said he had heard a few lectures on the subject in a normal school in Pennsylvania. In other words, while the most important part of education is the development and balancing of what is within a child, in most instances no training is required and little offered to fit teachers for this part of their work. What

would we think of a medical college that devoted all its attention to materia medica, and taught none of the principles of diagnosis? True education studies the child first and most; it regards him as a product. How can faculties and tendencies be developed and balanced when no attention is given to what they are? How can they be studied thoroughly when the fact is ignored that each child is little more than a stream of tendencies from the past coming into manifestation in the individual to be instructed?

I would not be supposed to think that we have no teachers who rise to their high privilege. Probably there are in all schools those who realize our ideal of the teacher, but it is because of natural gifts rather than because of the system under which they have been trained. Amiel says: "We can only teach others profitably what they already virtually know: we can only give them what they had already." Without recognition of the truthfulness of these words, plans for the culture and training of teachers will fail.

I will quote one more paragraph from the article of Dr. Hall: "One of the most hopeful things in education is the dawn of better and more objective ways of studying the mind and its growth. The old-fashioned philosophies, on which so many present methods of teaching are based, which are still well intrenched in most of our normal schools, seem imposing with their vast generalization, but are too introspective for youth, are formal, and, where most absolute, least harmonious among themselves. They have done great good, and it is not needful here to point out their grave defects. But better and more modern methods of research into the phenomena and laws of the soul, more consonant with the demands of modern and especially American life and thought, as specialized and co-operative as science, slowly doing over again the work of the great thinkers of the past century and without losing their positive result, removing their limitations, enriching and applying their insights—these are now slowly but surely working out a true natural history of man's nascent faculties. Here is the heart of the pedagogy of to-day and of to-morrow,

where the science and philosophy of education join friendly hands with the practical teacher, and here he who would speak with authority and be heard in the new departure already ripening must study with patience and love the psychology of the growing, playing, learning child and youth. Thus alone we can, in the language of the Laches, make the education of children our own education."[3]

The serious practical difficulty in the way of such teaching cannot be disregarded. Political tricksters care nothing for methods of education which put no money into their pockets and win no votes for their party. Penny-wise and pound-foolish tax-payers refuse the appropriations which are necessary to make possible the best methods in education. But no reform is easy. It is misconstrued, maligned, opposed with all arts until it wins, and then its opposers always believed in it. Progress will halt when difficulty is a reason for refusing to attempt better things. The peculiar difficulty which meets us arises from the fact that it is impossible to have schools which recognize the individuality of the pupils. It will be said, and truly, that our systems of education are directed not toward distinguishing but toward common characteristics; that that in which all are alike is more and greater than that in which they differ. The difficulty suggested here is practical. It is nearly impossible so to order public schools that the eccentricities of individuals shall be met. In private schools the difficulty is not so great, but does not altogether disappear. The only practicable scheme which suggests itself is the proper training of those to whom are committed the responsibilities of teaching. Schools cannot much regard individualities, but teachers can; and they can so order their instruction that each child shall receive that part of the curriculum which it most needs, and according to the best method. In order that this ideal may be realized, the study of human nature must always be placed above knowledge of books. In the preparation of the teacher, in the examinations through which he passes, this requirement should always be

[3] In the *North American Review*, February, 1885, p. 148.

placed highest. All that concerns the training of parents for their office applies equally to teachers, and I pass to that part of my subject.

Herbert Spencer has written words that may well be quoted here: "If by some strange chance not a vestige of us descended to the remote future save a pile of our school-books, or some college examination papers, we may imagine how puzzled an antiquary of the period would be on finding in them no indication that the learners were ever likely to be parents [or teachers]. 'This must have been the curriculum for their celibates,' we may fancy them concluding. 'I perceive here an elaborate preparation for many things; especially for reading the books of extinct nations and of co-existing nations [from which, indeed, it seems clear that these people had very little worth reading in their own tongue], but I find no reference whatever to the bringing up of children. They could not have been so absurd as to omit all training for this gravest of responsibilities. Evidently, then, this was the school course for one of their monastic orders.'"[4] The irony is deserved. There is no system of education that gives the slightest attention to training children for the discharge of what will some time be their most important and sacred obligation. If parents have no idea of what is in their own children, if they are not able to adapt their teaching to what is most needed, it is not surprising that teachers are not trained to do so. Few ever attempt what is not expected of them. What Mr. Spencer says about the young mother applies equally to the teacher of young children: "But a few years ago she was at school, where her memory was crammed with words and names and dates, and her reflective faculties scarcely in the slightest degree exercised; where not one idea was given her respecting the methods of dealing with the opening mind of childhood; and where her discipline did not in the least fit her for thinking out methods of her own. . . . . And now see her with an unfolding human character committed to her charge; see her profoundly ignorant of the phenomena with which she

[4] *Education*, p. 55.

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has to deal. . . . . She knows nothing about the nature of the emotions, their order of evolution, their functions, or where use ends and abuse begins."[5] One sentence more from Mr. Spencer: "Some acquaintance with the first principles of physiology and the elementary truths of psychology is indispensable for the right bringing up of children."[6]

Before education can be what it should and may be, there should be introduced into the curriculum that which may perhaps be called the study of human nature; children should in a noble way be trained to see what is in man as they are trained to find rare plants in the field and moss agates in the mountains. More careful nurture in the home will swiftly follow, and that in turn will not tolerate systems of culture in which all pupils are treated as if they were unplastic, and cast in one mold. In the building of a palace, granite is used for foundation, marble for walls and statues, precious stones and fair colors for ornamentation and decoration. All inorganic things are not presumed to be exactly alike; much less is there monotony among human souls. Shelley and Kant were no more alike than a lark and a dray-horse, yet in England both would have been put into the same intellectual hopper. Mrs. Browning and Adam Smith were at opposite intellectual poles, yet in our public schools they would be compelled to submit to the same discipline. Better no training than that which tends to efface individuality.

This paper emphasizes the principle that each child is at first a combination of streams of tendency from past generations, with mysterious elements of personality to which appeal can be made. If left to himself, he will go wheresoever those streams may tend. But the tendencies may be modified, the evil may be allowed no congenial air in which to grow, and be practically eliminated, while the good may be immeasurably strengthened by a new and better environment. Education should bring to bear on child-life such influences as will cause imperfection and bias to disappear and lead to the fullest possible development tendencies to the true, the beautiful, and

[5] *Ibid.*, p. 58. [6] *Ibid.*, pp. 63-64.

the good. In order that its ideal may be reached, education must be intelligent and work according to a plan: it must know the pupil better than books; it must be fully persuaded that the culture of an immortal spirit is as great a mission as the exploration of the stellar universe, and must always adapt methods to personalities. The practical difficulty can be largely overcome by training parents and teachers in knowledge of child-life. In order, so far as possible, to gain this, not only pupils, but their ancestry also, must be known. A teacher will be able to do better work for scholars if he knows something of their fathers and grandfathers. Blood always tells. Properly understood, pedigree of human beings is a more worthy study than chemistry or astronomy. Education should evolve that which is best in its object. Jean Paul says, "It is only mediocrity which supplants that of others by its own." The Master said He came not to destroy, but to fulfill. The best teacher never seeks to efface an individuality, but by effacing himself seeks to draw out to full and beautiful proportions the image of God in every child born into the world.

AMORY H. BRADFORD.

MONTCLAIR, N. J.

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V.

DISCUSSIONS.

THE FORTY-SIXTH MEETING OF THE MASSACHUSETTS STATE TEACHERS' ASSOCIATION.

One of the most successful meetings of the Massachusetts Teacher's Association was its forty-sixth, recently held in Worcester. The attendance was large, and the high character of the exercises secured for them thoughtful attention to the very close of the convention. Upon both days the morning program called together the entire association, but during the second afternoon a division into high, grammar, and primary school sections was effected. It is understood that the association is chiefly indebted to its lamented president, the late Dr. Lambert of Fall River, for the excellence of this recent meeting. Inasmuch as eleven principal subjects appear upon the program for the two days, the principal speakers being several more in number, anything like a complete report of the proceedings is entirely out of the question. It may be possible, however, to offer some comment of a general nature, and then to speak at slightly greater length in regard to one or two addresses which are worthy of special consideration. And first we may note that the exercises were not of a narrow or provincial character. The truth of this observation will be apparent to any one who observes the subjects of the various addresses, and also notices that many of the speakers either have no connection whatever with Massachusetts school affairs, or that their connection is somewhat remote or of no long standing.

The address of Dr. Stanley Hall upon "Recent Changes in the Primary and Grammar School Work in Europe," and that of Dr. Klemm upon "Lessons Learned from European Schools," may be considered together. They afford a good illustration of the non-provincial character of the meeting just referred to, and serve to emphasize the necessity, which is increasingly felt, of immediate and accurate knowledge of present phases of educational activity in other lands, as well as the need of a thorough knowledge of their educational history. It is greatly to be regretted that so few American teachers find it possible

to secure adequate opportunities for the inspection of European schools. Quite as much ought we to regret that so few of us possess that command of French and German which readily unlocks the treasures of the educational literatures of these peoples.

"The Teacher's Field of Study" was the subject of the address delivered by Dr. Dunton of the Boston Normal School. The paper was in full keeping with the reputation of its author, and its recommendations and advice carried with them great weight, because of the general conviction that they were the outcome of Dr. Dunton's ripe personal experience. I am obliged to pass with a simple mention the paper read by Superintendent Howland of Chicago, on "The Purpose of the Public School."

One of the strongest features of the Worcester meeting was the address delivered by State Superintendent Draper of New York upon "A Teaching Profession." Its strength depended in about equal measure on the rugged good sense of the views enunciated and the marked personality of the speaker. Such efforts upon educational topics as come from Mr. Draper's pen or voice are characterized by a certain "taking" quality, one which is generally conspicuous by its absence from educational utterances. Unless I mistake this quality is the outcome of Mr. Draper's preparation for, and experience at, the bar, emphasized undoubtedly by his contact with successive legislative bodies at Albany. The subject of his address upon this occasion had nothing of novelty to command attention. Under one caption or another it has been repeatedly discussed at meetings of the Massachusetts Association, but, so far as I know, never with the clearness, precision, and force which characterized Mr. Draper's treatment of it. The address has been printed, and a careful perusal of it is recommended to all readers of the EDUCATIONAL REVIEW.

Perhaps the most suggestive feature of the entire program was President Eliot's discussion of "The actual work accomplished in an average Massachusetts Grammar School." Not that I find it possible to agree at all with the distinguished gentleman's method of estimating either the extent or value of the work so accomplished. Indeed, I think his method as absurd as would have been the attempt in former years to determine the value to a student, of his Greek study at Phillips Academy or the Boston Latin School, and subse-

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quently at Cambridge, by noting the time which Prof. Felton would have required to glide over all the Greek text laboriously translated by the student. But nevertheless President Eliot's address was a delight. Beginning in a conciliatory vein—which I suspect he would not have employed a few years ago—adhering closely to the subject under consideration, the simplicity of his treatment, the readiness and exactness of his language, his spirit of candor and fair play, all combined to hold the closest attention of his auditors and to compel applause even where they did not carry conviction. Wherein, then, it may be asked, lies the usefulness of the address? I have space to attempt only the briefest reply. "Routine is always easier than intelligence," is a maxim true in all departments of activity, but pre-eminently true in the domain of school work. Nowhere is it so easy to fall into "wooden" ways of procedure. In no other occupation is there so strong a tendency to take up the work of predecessors in a wholly unthinking spirit, and to carry it on—but not forward—in the same way. Nothing but constant and thoughtful study of his work can preserve the teacher from complete slavery to traditions. At educational gatherings one is exposed to influences of two sorts, but in very unequal measure. The first sort may be spoken of as the "soothing syrup" variety. It is chiefly concerned in glorifying what has been and is. If we already have a comfortable feeling of satisfaction with present performances, this influence confirms it. If, perchance, we have become a little uneasy or disquieted in regard to present conditions, this influence comes to us as a soothing lullaby. Such influence secures present repose, but is fatal to progress.

The other variety comes not to bring peace, but a sword. Its great merit is that it compels thought. Its utterances may not be entirely and literally true. We may be able to partially controvert them. But they possess a measure of truth. We are compelled to acknowledge the partial truth, and likely enough are exasperated at being so compelled. Of this last variety President Eliot's address was an admirable example. Its great merit lies in obliging us to examine carefully into our whole body of faith and practice, and such examination is well nigh certain to result in innovation. Whether it so results or not, we are greatly benefited by having made the examination.

But, in conclusion, I do not wish to be understood to overvalue educational utterances which are wholly destructive in

their tendency. It may be acknowledged that constructive criticism is, after all, the more desirable sort. There are occasions, however, when the old building must be razed to the ground, before the new structure of greater beauty, symmetry, and strength can rise in its place. It behooves the entire teaching profession to give hearty welcome to all utterances which are characterized by the tone and temper of President Eliot's Worcester address. Let us approach them not "to contradict and confute, nor to believe and take for granted, nor to find talk and discourse," but rather, "to read, mark, learn, and inwardly digest."

G. I. ALDRICH.

QUINCY, MASS.

THE ILLINOIS STATE TEACHERS' ASSOCIATION.

The Illinois State Teachers' Association, in session at Springfield from December 29 to December 31, was in many respects a remarkable body. Six hundred persons were present as members of the association; and the enthusiasm was quite as marked as the numbers. The exercises, too, were of more than ordinary ability and value. Some of the papers read and the addresses delivered were marked by unusual power and wisdom. Among these may be mentioned the address of the president, Superintendent Walker of Rockford. Mr. Walker spoke of the recent legislation concerning the schools, and especially of the compulsory education law which went into effect July 1, 1889. He went on to show that this law was based upon a sound principle; that the condition of things in the state required its enactment; that its effect had already been largely to increase the attendance upon both public and private schools. He declared that the law ought not to be repealed, and that it ought not to be so amended as to impair its efficiency. He gave, also, a very thoughtful statement of the school-book question, sustaining his position by undoubted facts derived from the experience of different states.

Three solutions of the school-book problem were mentioned: (1) the manufacturing of the books by the state, and the requiring of the use of these books in all the school districts; (2) securing the books for the entire state from publishing houses by contract, thus involving state uniformity; (3) empowering the local school authorities to furnish books to

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each pupil gratuitously, the same to be paid for from the public funds—the books not to be owned by the pupils, but only to be loaned to them. Mr. Walker gave very good reasons for preferring the last of the three methods.

Another notable address was that of the Rt. Rev. John L. Spalding, Roman Catholic Bishop of Peoria. His subject was, "Religious instruction in state schools." He declared that there are three views on this subject. According to one of them, religion has no place in education. The effect of religious teaching is always injurious to the intellectual and moral status of the pupil. In his comments on this sentiment the eloquent speaker quoted with great effect from a recent French writer, Issaurat, who takes the most thoroughly materialistic view of life, its surroundings, and its destiny. Another opinion is that religious instruction is the essential thing in the education of children. Around the idea of God cluster all inspiring thoughts, all uplifting impulses. To neglect religious instruction is to neglect the principal thing in the development and perfecting of the human soul. This view is held by Christians, as a rule. It is more strongly insisted upon by certain Christian bodies than by others. But in substance, it is common to them all. By a third class of persons the importance of religious instruction is conceded, but, on account of certain elements in the social and political condition of our people, it is not thought wise to impart this instruction in the state schools.

Public sentiment on this subject has changed since the first establishment in America of the free public school. At that time the schools maintained by public tax were considered the proper institutions for the teaching of religion. The religious faith of the New England communities was clearly and faithfully taught in these schools. But in those communities at that time there was a degree of unity in religious belief which has since passed away. Since that time, Christian denominations have multiplied and differences have come to exist between these different bodies in respect to articles of belief. This makes it impossible to impart fully the tenets of any one denomination in a school supported by all the people. The result has been, to a large extent, the exclusion of religious teaching.

Bishop Spalding took occasion to commit himself fully in favor of the principle of compulsory education, and nothing that he said during his entire address elicited such hearty and

long-continued applause as this. He also paid a glowing tribute to the power and worth of the English language, and to the necessity for its use in the schools. The substantial soundness of American public sentiment was dwelt upon, and, although certain dangers and evil tendencies were pointed out, still the general tone of the address was hopeful and inspiring.

The Bishop was followed by George P. Brown, editor of the *Public School Journal.* Mr. Brown's paper was ably written, and logically arranged. It was a lucid exposition of the third view to which Bishop Spalding had referred. Mr. Brown expressed himself strongly as to the value of religious instruction; but he maintained that such instruction, so far as it relates to dogmas, should be imparted in the homes, in the churches, and in the Sunday schools.

It was interesting to notice the evidences of the prevalence of certain sentiments among the multitude of teachers. The feeling in favor of the compulsory education law now in force in the state was exhibited in a great variety of ways. No speaker could refer to it without eliciting emphatic applause. In the resolutions adopted the subject is referred to, and the Association is fully and formally committed to the support of the law. The law is approved because it is in the interest of humanity and of personal liberty, and because its effect will be to promote the intelligence and the manly and womanly worth of the rising generation. The strongest and most unequivocal utterances on these points were demanded by the assembly.

The same may be said, though perhaps in a lesser degree, of the proposition to furnish text-books free to the pupils in the public schools. It is clear that the teachers have a dread of the great aggregation of pecuniary interests that would be involved in the manufacture of the text-books by the state, and also, to some extent, in the supplying of these books by a general state contract. It was declared that free text-books savor no more of paternalism than free tuition, free school buildings, free fuel, or free libraries.

The convention also took proper action in regard to the Columbian Exposition to be held in Chicago in 1892–93. The fact that this great celebration is to be held within the borders of the state of Illinois was duly considered and provided for. A committee of fourteen was appointed to represent the educational interests of the state. It is the duty of this committee

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to secure from the National Commission and the Board of Directors such facilities in the way of grounds as may be required for the state exhibit. They are also to secure from the state legislature such appropriations as shall be necessary to erect buildings and collect materials for the exposition. The committee is composed of well known, successful educators, who have a reputation for scholarship as well as practical good sense.

NEWTON C. DOUGHERTY.

PEORIA, ILL.

PUBLIC DISPUTATIONS.

The holding of a public disputation at Woodstock College, Maryand, a short time ago, has called forth the expression of a desire to see the character and pedagogic interest of the exercise set forth in this REVIEW. Disputation is an old field of activity with the Society of Jesus. Leopold von Ranke, narrating the changing fortunes of the great religious and theological war of the Reformation, says that "the Jesuits lectured with the utmost diligence, even during the holidays, reviving the practice of disputations, without which they declared all instruction to be dead. These disputations, which they held in public, were conducted with dignity and decorum, were rich in matter, and altogether the most brilliant that had ever been witnessed."[1]

The theses drawn up by the young defender at Woodstock, on the occasion referred to, were not posted up at a church door, but were printed in a pamphlet, and distributed months before to all whom they might concern. They are 278 in number, filling sixty-seven pages octavo. The title page announces that they are to be defended by Father George De La Motte; and the challenge is given to the world in these terms, "*Facta cuilibet arguendi facultate*"—all comers are free to assault. The champion indites a respectful dedication to his Eminence Cardinal Gibbons; who, in fact, presided during the four hours' intellectual tournament. To make sure of a body of well-prepared objections, a number of distinguished men are usually offered, long beforehand, a reserved place in the lists. Twelve such appeared on this occasion from the different learned bodies of the country. According to custom, every one kept his own secret as to the point which he wished to assail.

[1] *History of the Popes*, Book V, 3.

The language used was Latin; the form syllogistic—a form admirably adapted to the conduct of incisive argumentation, and the economizing of time. To defend these in this scholastic or syllogistic style, no man will stand up before the world who has not first possessed himself of his conclusions by a rigid process of demonstration. The objector taking the peremptory stand against him, which in logic is called "elenctic," throws the doctor back on the defense called "apologetic." And this defense must cover as well the ground of demonstration on which the defender chooses to rest his tenets, as their consequences, and their coherence with other truths, and every other issue or avenue of approach.

Wherefore, undertaking to refute, the objector states the precise contradictory of the thesis which he selects. This being rebutted, he proceeds to establish it by the line he thinks fit to follow. As the argument advances, all concessions made by the defender, in his successive distinctions and subdistinctions, remain good as common admitted ground, and therefore as a basis for the argument *ad hominem*, if any inconsistency is detected. The objector assumes at each successive step the part denied, which he has to prove if he will make good his original exception to the thesis. At some points he finds the road diverging into two or more lines of argumentation. To save himself, lest he run against a wall and have nothing further to urge, he will have foreseen at each step these side issues, by which, when driven to the end of one course, he may recover himself and start out on another. Quibbling, playing with words, returning to a ground once cleared, wasting time through imperfect syllogisms, asking too often for reasons, introducing parentheses, are all to his discredit, in presence of a distinguished audience, consisting on the recent occasion, of some eighty learned visitors and critical students. In the daily practice of the schools such talking against time is promptly cut short by the authority presiding.

Hence, in the objector's grasp, the difficulty which he means to propound must practically reach the fullness of a scientific demonstration. And the clearest grasp of the most solid difficulty does not enable him to advance far in the face of an able defender, but he finds that his acutest forecast has only approximately determined where he is lodged at any given point in the argumentation, and what his logical responsibility at the

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moment is. If he has not foreseen the precise face which the defense assumes, if he has failed to define an element to his own mind, or to see the bearings of the divers parts of an argument, he will find himself in the familiar situation of one who could have been eloquent on the subject if he were alone, who could have written elegantly and amplified eruditely on the dead page; but not so now in the face of a living antagonist, who lets nothing pass, holds to everything once granted, and admits nothing that is once denied, unless it is demonstrated.

Meanwhile, each of them, if they are accomplished men, finds time enough while catching the other's reply to shape his immediate course. For every syllogism as presented is repeated carefully by the defense to make sure it is the identical one; then, as returned saddled with its distinctions, it is taken up exactly by the objector. Of his part it may be said, that his subject will be a rare and rich one if it holds out longer than half an hour. Oftentimes, a quarter of an hour, or twenty minutes, will exhaust the best prepared difficulty, and reduce the objector to the necessity of changing his middle term; that is, waiving his exception, and starting again from some other side. But by this time he usually expects to get the ready relief of hearing the time called. And he falls back and draws breath, happy to see the next run in.

As to the Latin language, I may say in brief that no instrument for the expression of thought, philosophical, clear, and fine to the last degree of acuteness, can compare with a tongue which was elaborated, in this very practice, from the twelfth century onward, and that in the sixty-six universities of Europe. After the Renaissance, scholastic Latin developed into the fullness and richness of that Ciceronian style which the colleges cultivated with so much ardor; but it retained the extreme subtleness and keenness of edge which renders it possible, as any one may see for himself in a Peripatetic lexicon, to express a world of complex distinctions, each in a fixed and mathematically precise word; as when the term, "formaliter," with its sixteen different meanings, is in any given proposition fixed and stereotyped in its meaning here, by co-ordinating it in a distinction with some one of its sixteen co-relatives, and granting or denying the proposition under this precise and exclusive aspect.

If it be asked, how can such acumen be developed in students, it must be borne in mind that it is the result of daily

practice, during seven mature years, in philosophy and theology. The following rule of the Jesuit *Ratio Studiorum*, which applies, indeed, directly to certain more formal or monthly disputations, will sufficiently exhibit the method of every day: "Let the professor consider that the day of disputation is not less laborious and useful than that of his own lecture; and that all the fruit and life of the disputation depends upon him. In presiding over his own disputation, let him be as if he were identified with each of the contestants; let him show approval if anything good is advanced, and maintain the strictest attention on the part of all. If any argument of special difficulty is proposed, he may throw out a hint here or there to support the defender, or to direct the objector: let him not be silent a long time, nor yet be always talking, that the students may bring out what they know. What is so brought out he can amend or improve; let him bid the objector procēed, as long as his argument carries weight with it; let him urge the difficulty farther, nor connive at it if the objector slips off to another line of argument. He is not to allow an argument which has been well solved to be carried on farther, nor an answer which is not solid to be long kept up; but after a sufficient dispute, let him briefly define the whole matter and explain it."[2]

THOMAS HUGHES.

DETROIT COLLEGE,
DETROIT, MICH.

THE FOURTH ANNUAL MEETING OF THE AMERICAN ECONOMIC ASSOCIATION.

The fourth annual meeting of the American Economic Association took place in Washington during the Christmas holidays. It was by all means the most successful convention that the Association has ever held—successful not only in the attendance and in the quality of the papers submitted, but also in the mutual helpfulness and stimulus to the members present. The results of the meeting may be discussed under three heads: the papers presented, the new work undertaken, and the general influence on economic thought.

A word as to the papers. The first place must naturally be given to the president's address. General Walker has been so

[2] Rule 18 of the "Common Rules for the Professors of the Higher Faculties," given in *Monumenta Germaniæ Pædagogica*, v., 292.

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long *facile princeps* among American economists that he has been re-elected president from year to year—an honor again conferred upon him at this meeting. The honor is not without its disadvantages, for it must be a trying task to deliver, time after time, a presidential address which ought to be fresh, striking, and stimulating. President Walker, nevertheless, acquitted himself with distinction on this occasion, giving a masterly review of the four chief topics now engaging popular attention—nationalism, the single tax, the monetary problems, and the immigration question. It may have occurred to some economists that the president's address might more profitably have been devoted to a review of scientific thought among the American economists themselves, summing up the salient points of any distinct advance upon the work of their predecessors. But it may be that General Walker shrank from this, because of the obvious necessity of calling attention to his own work, which has formed so signal a part of this body of new thought. It is to be hoped, however, that the incumbents of the presidential chair on future occasions, whoever they may be, will devote a portion of their addresses to this subject.

Of the purely theoretical papers, one of the most striking was presented by Prof. Giddings of Bryn Mawr on the "Concepts of Utility, Value, and Cost." So much that is superficial and inane has been written on these topics, that it was a veritable pleasure to listen to an analysis, the result of such clear thought and expressed in such straightforward style. None but the clearest thinkers should grapple with such a problem. Prof. Giddings has shown that he is fully acquainted with all that has been said on the topic, and his paper served to throw much light on the complicated questions involved.

The subject of transportation was represented by Prof. Taussig of Harvard, who read an interesting paper on the theory of railroad rates. Of more immediate interest were the papers on statistics, especially the report of Mr. Carroll D. Wright on the general progress of statistical investigation in this country, and the remarkable paper of Prof. Henry C. Adams on statistics as a means of correcting corporate abuses. Noteworthy also were the addresses of Prof. Dewey on the limits of publicity, and the exceedingly valuable papers by Messrs. Fernow, Pinchot, and Bowers on the forestry question. Finally, the readers of this REVIEW would have been especially interested

in the report by Prof. Patten on the educational value of political economy, and in the discussions both of this topic and of the subject of industrial education, in which such men as Professors R. M. Smith, Folwell, and Felix Adler took part.

Hitherto the annual publications of the Association have consisted of six monographs on scientific subjects. In future all publications are to be supervised by a specially elected publication committee, and the scope of the work is to be enlarged. It has been decided to begin the publication of translations of the chief economic works in foreign languages, especially those which have contributed to a decided advance in economic theory. For the coming year a selection will be made from among the three prominent German writers, Knies, Wagner, and Cohn. It is hoped that one volume will be issued annually, thus bringing before the American public the best results of foreign thought.

Steps have also been taken looking to the regular issue of a series of popular articles and leaflets on economic questions of live interest to the people at large. This is to supplement the purely scientific work, and is expected to exert a signal influence in disseminating information from a non-partisan standpoint. In other words, the American Economic Association desires to keep in touch not only with the special student, but with the intelligent population of the country.

The general impression left by the recent meeting is to the effect that we are fast beginning to have a distinctively American school of political economy—American not so much in its method as in its independence, its aims, and its catholicity. Only a few years ago what little there was of economic science in this country was exclusively in the hands of the most rigidly "orthodox." It was the English classical school, writ not large, but small. Then came the exodus of the American student to Germany, and his return home with great ideas of reform and improvement. At first the young American professors were almost all followers of the new German methods. And it is not to be denied that the influence of the historical school was strong and abiding. But with the emergence of the American student from the swaddling-clothes of the German university, it was gradually recognized that something more was to be accomplished. The Germans have done a good work in their day, and a knowledge of what they have accomplished is indispensable to all modern students of economics.

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But they stopped short in their development; or rather they pushed it to an extreme. The Austrian reaction arose, and made an energetic protest. The Italian reaction developed, and had a considerable success of its own. In fact, it may be said that the best work in economic science to-day is being done, not by the Germans,—who have failed to maintain their reputation for wide knowledge of foreign literature and for catholicity of thought,—but by the Italians.

So also in America. The great body of American economists are no longer content with the orthodox doctrines of the classical school. But on the other hand they have broken loose from the complete domination of the German methods.

They are beginning to study American problems and in a distinctively American way. They have no exclusive bias for induction or for deduction, for history or for theory. They welcome all good work, by whatever method obtained, from whatever source derived. But they are gradually building up a body of doctrine which is *sui generis*, and which affords in some respects an original explanation of peculiarly American problems. If the recent convention had done no more than merely emphasize this fact, it would have been a success. It has imbued all of us with confidence and filled us with high aspirations. It has also knit us more closely together, and has opened up to us the vista of boundless possibilities and of arduous work.

EDWIN R. A. SELIGMAN.

COLUMBIA COLLEGE, NEW YORK.

VI.

EDITORIAL.

From Berlin comes the announcement that the following are actually serving as members of the Commission of Inquiry concerning school reform: Dr. Albrecht of Strassburg, government councilor; Dr. Bertram of Berlin, member of the city school council; Dr. Deiters of Coblenz, member of the provincial school council; Count Douglas of Aschersleben, deputy; Dr. Eitner of Görlitz, director of Gymnasium; Dr. Fiedler of Breslau, director of Oberrealschule; Major Fleck, representative of the Minister of War; Dr. Frick of Halle, director of the Waisenhaus; Dr. Frommel of Berlin, chaplain of the garrison; Dr. Frowein of Elberfeld, manufacturer; Dr. Göring of Berlin, author; Dr. Graf of Elberfeld, physician; Dr. Güssfeld of Berlin; Dr. Heereman of Münster, deputy; Dr. Hinzpeter of Bielefeld, privy councilor; Dr. Holzmüller of Hagen, director of Höhere Bürgerschule; Dr. Hornemann of Hanover, gymnasial teacher; Dr. Jaeger of Cologne, director of Gymnasium; Herr Kaselowsky of Berlin, commercial councilor; Dr. Klix of Berlin, member of the provincial school council; Dr. Kopp of Breslau, bishop; Dr. Kropatschek of Berlin, editor; Dr. Kruse of Dantzic, member of the provincial school council; Dr. Matthias of Düsseldorf, director of Gymnasium; Dr. Matzat of Weilburg, director of agricultural school; Dr. Moseler of Trêves, director of the theological seminary; Dr. Paeler of Wiesbaden, director of Gymnasium; Dr. Rehrmann of Gross-Lichterfelde, instructor in the military academy; Dr. Paulsen of Berlin, professor in the university; Dr. Schauenburg of Crefeld, director of Real-Gymnasium; Dr. Schlee of Altona, director of Real-Gymnasium; Dr. Schottmüller of Berlin, privy councilor; Dr. Schrader of Halle, curator of the university; Dr. Schulze of Berlin, director of Gymnasium; Dr. Tobler of Berlin, professor in the university; Dr. Uhlig of Heidelberg, director of Gymnasium; Herr Uhlhorn, abbot of Loccum: Dr. Virchow of Berlin, professor in the university; Dr. Volkmann of Schulpforta, director of Gymnasium; Dr. Zeller of Berlin, professor in the university. In addition, Privy Councilors Hofpner, Stauder, and Bohtz are named as special representatives of the Minister of Education.

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It is difficult, at this distance, to gain a very accurate idea of the character of the commission. Virchow, Zeller, Paulsen, Tobler, Volkmann, Schulze, and Uhlig are strong names: few stronger ones could be found in all Prussia. But mediocrity seems to have an undue representation.

The opponents of the present educational régime complain, with apparent reason, that they have not been fairly treated in the make-up of the commission. The Real-Gymnasium has only one fourth of the representation accorded to the Gymnasium. But a single mathematician, Holzmüller, is appointed, and only one natural scientist, Virchow. It is not impossible that the commission has been constituted so as to insure the return of a predetermined report. It is sincerely to be hoped that this is not the case; for in many respects the commission is the most important educational body of our time, and its conclusions ought to be wholly unbiased. Prussia's example in matters of this kind is of capital importance, not only for Germany, but for the civilized world. Von Humboldt and Schulze made the higher education of Prussia the most efficient in existence. It is a matter of some importance to know whether the product of their genius is to be discarded, reformed, or developed. That the emphatic, not to say vehement, educational pronunciamento of the Emperor has had its effect, is made clear by the conclusions already arrived at by the commission.

The annual reports of the presidents of Johns Hopkins and Cornell universities and of Columbia College, have recently been issued. They constitute a very interesting and instructive report of progress at those great centers of learning. President Gilman notes with pardonable pleasure the improved financial condition of his university, and very frankly adds a succinct statement of the finances of the institution. Their condition was serious indeed, and it was an ominous moment in the development of the higher education in America, when thought was devoted to solving the problem as to "what departments of the university work could be abandoned with the least amount of injury." During the year the degree of Bachelor of Arts was conferred upon thirty-seven candidates, and thirty-three candidates were promoted to the degree of Doctor of Philosophy. One hundred and eighty-four persons have been advanced to the degree of Doctor of Philosophy since the

university was opened. The time has come when larger and better buildings are needed, and President Gilman urges that early provision be made to house properly both the library and the advanced work in literature, history, and philosophy.

President Adams, too, speaks of a prosperous year, and reports that the number of students at Cornell reached 1330. The needs that he emphasizes are an annex to the gymnasium, a hall for the collection of plaster casts, a building for the use of the School of Law, and a building for the department of agriculture. Dean White makes some interesting statements regarding the practice of admission by certificate. One hundred and fifty-six students were admitted to the freshman class in that way in the autumn of 1889. Of the practical working of the system as it affects the student, the Dean says: "The applicant passes easily and freely from the school to the university. He is not required to review a number of topics which have found their due place and have served their purpose in the earlier years of the school curriculum, but enters upon his university course free from the jaded feeling which would often result from such an excessive and needless strain of preparation. He is relieved from a preliminary journey to the university, which is frequently long and costly—the sequel of which may be doubtful, if not unfavorable—and receives at any time during the year, instead of at certain fixed and often inconvenient dates, a decision as to his actual status of preparation. Leisure may thus be afforded him to strengthen his weak points in advance, to concentrate his attention upon especial branches, and to anticipate occasionally a part of the work required after entrance."

The report of President Low is of more than usual interest, not only because it is his first report, but also because educational changes of the first magnitude have been made at Columbia during the year. Here, more fully than anywhere else in this country, has the distinction between the college and the university been grasped and embodied in the organization of the same institution. President Low finds a difference not only pedagogic, but financial, between a college and a university. He says: "A college, using the word in a pedagogic sense, which sets before itself, as its aim, instruction in a definite curriculum, may possibly have command of means enough. But a univer-

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sity, again speaking pedagogically, never can have enough. By a university I mean an institution where instruction can be had in the highest reaches of every known department of knowledge, and where researches are always being carried on to widen the domain of what is known and taught. Because knowledge grows, the university must grow with it, and such growth is as costly as it is essential."

We miss in this report a feature which for some years past has made the reports of the president of Columbia College especially valuable to students of education. We refer to the appendices containing the statement in detail of the work of the several departments and schools. The publication of these details is the easiest and cheapest way of putting before scholars a record of the educational work actually done at any given institution. Without them a president's report is of very much less value and importance. It is to be hoped that their omission in this case is unintentional, and that they will be restored in future years.

The trustees of the John F. Slater fund announce that, in view of his election as a Bishop of the Methodist Episcopal Church, South, Dr. Atticus G. Haygood will retire from the office of general agent of that fund in May next, after a successful service of nearly nine years. In order that there may be no break in the continuity of the Slater work, the trustees have already invited Dr. J. L. M. Curry, the general agent of the Peabody Education Fund, to assume the duties which Dr. Haygood will relinquish. Dr. Curry has been elected a member of the Slater board, and has been appointed chairman of the educational committee, the other members of which are Senator Colquitt of Georgia, Rev. Dr. Broadus of Kentucky, the president, the treasurer, and the secretary of the board. This committee will give special attention during the current winter to the subject of industrial education and manual training. The trustees of the Slater Fund are to be congratulated on securing the official co-operation of Dr. Curry, than whom no one is better informed regarding the details of the educational work now being carried on in the South.

A forcible appeal has been issued by the American Society of Naturalists, addressed to the several college faculties of this

country. It asks that an examination in elementary science be included in the requirements for admission to college. Some weeks since, the association of officers of colleges in New England, ten college presidents being present, unanimously adopted a resolution indorsing the society's appeal.

We call attention to it at this time for the purpose of giving it most emphatic endorsement. One of the most serious faults in our present educational program is the postponement of the study of nature until late in the course. In many parts of the country the study of natural science is excluded from all schools below high school grade, from the classical or college preparatory course in the high schools, as well as from the first year or two of the classical course in the college. The result is that a very large proportion of our school population conclude their formal education without any knowledge of these subjects whatever.

No proposition in education is more certain than that the systematic study of nature should begin in the earliest period of school life. The instinctive curiosity of childhood puts many questions in regard to natural phenomena, that the school makes no attempt to explain or to answer. We are glad that the Society of Naturalists are lending the weight of their authority and influence to the righting of this pedagogic wrong. They ask for the teaching of science in all grades, beginning with the simple object lessons of the kindergarten and primary school. In no way can this be more quickly brought about than by including an examination in elementary science among the requirements for admission to college. The higher influences and stimulates the lower. What the colleges demand will always be furnished by the secondary schools. If this appeal is heeded, as it should be, a long step forward will have been taken in our educational development.

The last annual report of the city superintendent of schools in New York, states that during the year 1889 not less than 5000 children, reported from the schools as truants, in accordance with the compulsory education law, were detained at home by their parents. There is good reason to believe that poverty was the cause of the detention in a considerable proportion of these cases. In the last Brooklyn report the statement is made that poverty was the cause of the detention from

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school, of 422 children. In other of our large cities, were similar statistics collected a similar condition of affairs would, doubtless, be revealed. It is useless, for the present purpose at least, to seek the cause of this poverty. It may be, in most cases it probably is, the result of the thriftlessness and depravity of the parents. The facts that concern us now are that these children are hungry and are not fed, that they are naked and are not clothed, that they are ignorant and are not taught. Orphan asylums and other charitable institutions, excellent as is the work they are doing, do not reach such cases as these. The law says that the child must attend school; but the machinery of the law breaks down when confronted by abject poverty. Indeed, in New York state, it breaks down, so inadequate is it, when confronted even by the opposition of parents. What, then, is the remedy? A compulsory law that would really compel, that would punish parents who neglect their children, and that would require local authorites to enforce its provisions, would accomplish much, but it would not accomplish all. There would still remain many cases of destitution that could be alleviated only by other, and far different, means. Surely it is possible to do more than is done at present to educate the children of the very needy, and to prevent the offspring of the vicious from following in the footsteps of their fathers. The problem is one worthy to tax the ingenuity of the statesman and to enlist the noblest impulses of the philanthropist.

How can the superintendent of the school system of a large city best reach the rank and file of his teachers? This question has been attracting attention of late in New York city, and quite recently a system of grade meetings was inaugurated and is now in full operation. The teachers of that city have been divided up into convenient groups, according to locality and grade, and the assistant superintendents meet them regularly to give instruction in the details of the new course of study. In smaller cities, where the teaching force is not large and the duties of the superintendent not too onerous, the practice generally prevails of frequently convening both principals and teachers for instruction in all matters concerning the welfare of the schools.

But in cities like New York it is manifestly impossible

to assemble all the principals and teachers in one body for purposes of instruction. Hence the superintendent, if he wishes to reach his teachers, has but two courses open to him: he may meet the teachers by grades or sections, or he may meet the principals only, and transmit through them the necessary instructions of whatever nature. In matters of lesser importance, that relate chiefly to school organization and government, the best and most practical method of reaching the class-room teachers is undoubtedly the latter. This may be called by way of distinction the army plan, and for certain purposes it has obvious advantages. It is by all means the easiest and quickest way to issue orders and to put them into execution, whatever may be said of its failure in other important respects. It has also the merit of convenience, and it tends likewise to establish and maintain proper respect for superiors and subordination to authority. For certain minor ends, such as, for example, communicating the rules of the Board of Education with reference to admissions, modes of marking, and so on, it is undoubtedly the most economical and efficient plan. When, however, it is desired to give specific instruction in methods of teaching, this system is open to very serious objections.

Assume that new methods in drawing or science-teaching are to be introduced into the schools. The superintendent calls together his principals and tries to saturate them with his own ideas. But herein lies the practical difficulty: for not all principals are easily saturated. Some, perhaps, may be impervious to anything that is new; others may be out of harmony with the proposed changes; and not a few may be good receivers but poor transmitters. If principals were sponges, and the superintendent or his assistants could fill them at will and by judicious squeezing exhaust their contents in any school, this plan of mediate instruction would be most commendable.

The great problem in every department of human industry is how to secure the greatest degree of efficiency or productiveness at the least cost, or, otherwise stated, with the least expenditure of labor and time. All mediate processes that consume energy and decrease efficiency are wasteful and should be eliminated when possible. So, to avoid waste of effort in

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education, the superintendent should convey to his teachers his own messages, if he has any for them. Personal enthusiasm, sympathy, the stimulus of immediate contact, are of the utmost importance. The most brilliant orator would fail to hold and interest his hearers through the medium of a phonograph. There is no place in modern education for the proxy superintendent.

We are glad to learn that at the recent meeting of the Illinois State Teachers' Association, the little-understood subject of elementary science teaching received a large amount of careful attention and discussion. Nearly half a dozen papers, some of them very striking, that dealt with this topic in some form or other, were presented. A report was adopted which declared the purposes of elementary science instruction to be: (1) training to accurate observation, to careful comparison and generalization, and to correct and fluent expression; (2) to develop a sympathetic interest in nature for its moral effect as well as for its influence upon the intellectual activities; (3) to develop the causal idea, and to teach the uniformity of natural processes; (4) to furnish material for reading and language training.

For the subject-matter, zoölogy was preferred for the lower grades. After three years of study in zoölogy, the science work, it was thought, should be related as closely as possible to the instruction in geography. Such a program is at once intelligent and comprehensible, and it is sincerely to be hoped that the Illinois teachers will not rest content with passing resolutions about it.

One fact, of great importance to elementary science teaching, must not be overlooked in carrying out plans of this kind. Facts of everyday experience, those which it is most profitable for the young child to observe and to study, may be under one aspect physical, under another chemical, under a third biological. The classification of the fact as belonging to one branch of science rather than another is of small importance for the child. The fact itself, its conditions, causes, and consequences, are the main thing for him. Elementary science teaching must remain elementary. It need not be limited to some one of several branches of science. It should rather involve something of many.

VII.

REVIEWS.

Lectures on Language and Linguistic Method in the School. By S. S. LAURIE, LL.D., Professor of the Institutes and History of Education in the University of Edinburgh. New York: Macmillan & Co., 1890, pp. viii., 147.

The lectures gathered together in this little book were delivered at the University of Cambridge, and subsequently in London before the College of Preceptors. They have also been published singly in *The Educational Times*, beginning in June, 1889. Their delivery and publication have excited a widely spread interest, an interest due in part to their subject matter, but due even more to the brightness and vitality of Professor Laurie's presentation of a subject usually made dry to aridness. They are the work of an alert and resolute thinker, bent on saying openly but moderately the best he has to offer. The scanty limits of his space compel a compact and tersely suggestive rather than a sufficiently elaborated treatment. His aim is to give in outline, with such helps in illustration and application as can be given, a summary of what is the best way to teach language and literature to pupils before their university life begins. And in this he is highly successful, we might almost say completely successful, so long as he keeps to his theme. It must be said, however, that when Professor Laurie goes beyond his bounds into the relations of his subject to the mysteries of ethics and religion, we miss at times his usual penetration and strong common sense. Such, for example, are some of the remarks in his sixth lecture (pp. 87, 88). Take this one: "The finer organizations, by their innate force, pass from the preceptive morality of the boy-life into the ideal life of adolescence without effort and without teaching. The man has to be educated into it. The passage from the one mental condition into the other is what old theological writers described as conviction and conversion and regeneration. This it is to be born again. This is, fundamentally, Christianity." Whether this nebulous generalization would have enough Christianity in it to satisfy even Mr. Matthew Arnold's canons, is doubtful. It is more than doubtful whether it is proper to

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Professsor Laurie's theme, even if literature is to be made the the great helper toward this spiritual transformation.

But let us return to his proper theme,—method in teaching language and literature to pupils in the period previous to university life. For this formative period Professor Laurie argues with much force that language is the supreme instrument of culture. No exposition of his arguments can be made here, for they are put as tersely as may be in his book. His major premise, however, is that to secure this culture we must have, as a general study, "a concrete subject which contains the abstract in its purest form and at the same time gives substance of instruction. This subject also must be universal in its character if it is to be effective for its end in the fullest sense." His minor premise is, "That subject is Language" (Lecture 1). Following up his conclusion that language, broadly speaking, must be the thing taught, he proceeds to inquire, how? And herein lies the especial charm and value of his book. The standpoint assumed is that of sympathetic insight into the psychological status of the pupil at every stage of his development. Given this, then it remains to discover and apply in teaching always and only what suits the pupil's condition. Here Professor Laurie is at his best. He is hygienic or nothing.

What, then, are the chief phases of linguistic teaching, according to the author? Clearly three: language used as substance of instruction, as a formal discipline (grammar), and as literature. Each of these is to be introduced in the order indicated. This is not unfamiliar as a division of parts. It is not mainly or notably new, but it is wholesome. Professor Laurie's entire sympathy with the using of language-material copiously and heartily for early teaching and his abhorrence of "grammar as grammar" before a boy reaches about twelve years of age, will be applauded strongly in our own country. His treátment of the second phase, the grammatical, is also happy. He would keep grammar, but keep it in bounds. The grammar stage he places at from twelve to sixteen years of age. It is indispensable in its place, and should be kept to mastery of the main principles with no linguistic riddles. "Beyond that general analysis which brings into relief the logical construction of a complex sentence, you do not help the boy" (p. 59). This is plain good sense about syntax, if there ever was any.

The third phase, language as literature, is to come last, though it begins embryonically while the other two are pro-

gressing. Here is the fruition and enjoyment of the preceding; and, short of this, final satisfaction is not attained on the side of the humanities. The book closes with a discussion of teaching foreign languages, taking Latin as a type, and incidentally sets forth what Professor Laurie regards as the reasons for retaining the classics in our scheme of education.

The chief value of the book, as a whole, is not in its systematic completeness. It seems at times roughly blocked out and without due interconnection and finish. This should not be laid wholly, or even mainly, to the author's charge, for his theme is too complicated for a little book, and too undeveloped by educational science at its present stage, for complete treatment even in a big book. But it is a valuable book, probably more valuable than any other book on the same theme. It is full of suggestion, wide-awake and awakening, and keeps sensibly away from empty theorizing as well as dry-as-dust fumbling of facts. It is a strong plea for rational teaching of the humanities, made by a friend,—but a friend who has no patience with either smattering or pedantry.

ANDREW F. WEST.

The Teaching and History of Mathematics in the United States. By FLORIAN CAJORI, Professor of Physics at Colorado College. Washington: Bureau of Education, 1890, pp. 400.

This work has been in preparation for almost two years. During that time the author has been in correspondence with teachers all over the United States and has examined a great mass of records bearing directly and indirectly upon his subject. His book cannot fail to exert a beneficial influence upon mathematical teaching in this country, which, generally speaking, is of a very inferior character. Our comparative backwardness in mathematics is oppressively evident throughout the book.

Mathematical teaching in this country has always been under the immediate influence of European teaching. A history of it describes how we, or great classes among us, at different times, have followed the examples of different European nations; how teachers have come from Europe to certain schools or colleges, reproducing in them, as far as possible, the methods and books of their previous experience; and how, more recently, many of our ablest men have gone abroad and have returned to introduce the results of foreign teaching among us, much more

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effectively than they could be introduced by foreigners. Roughly speaking, and excepting always the deep impress left upon American books and American teachers by that distinguished mathematician Benjamin Peirce, the mathematical teaching of the past in this country has little to do with the mathematical teaching of to-day.

The author divides his history into two great periods: that of English influence, and that of French. The former begins in colonial times and was brought to an end finally through the influence of the United States Military Academy at West Point, and of Harvard College. At the present time a cosmopolitan spirit has crept into the mathematical work of many of our educational institutions. Some of our schools are still in bondage to the text-books and methods of a less advanced age. Their number is, however, a variable and diminishing quantity. Our new text-books, too, are not yet altogether satisfactory, but steady improvement may be observed. Among our universities some very good advanced work is being done. It can no longer be said that but a single important original contribution to pure mathematics has been made in America. Pierce's classic memoir, however, has yet to yield to another the place of honor among American mathematical monographs.

The most remarkable feature of this book is the sixty-four pages devoted to statistics illustrating the present condition of mathematical teaching in the United States. These statistics are gathered from 168 colleges, 45 normal schools, and 181 high schools and academies. A set of questions was submitted to each of these institutions and the answers are tabulated. The questions addressed to the high schools were: What reforms are needed in teaching arithmetic? To what extent are models used in teaching geometry? To what extent and with what success are original exercises given? Is the metric system taught? Which is taught first, algebra or geometry? How far do you proceed in the one before taking up the other? Are percentage and its applications taught before the rudiments of algebra, or after? Are pupils permitted to use answer-books? The answers of forty-five per cent. show little or no use of geometrical models. A large majority claimed to give at least one fourth of their time in geometry to original exercises. All teach the metric system, but many pay very little attention to it. All but a dozen teach algebra before geometry; two teach them together. Less than a dozen teach percentage after

algebra. They probably teach it before also. A large majority permit the use of answer-books. Among the normal schools, three teach geometry before algebra and two teach them together.

A great variety of questions was put to the colleges. Harvard, Yale, Princeton, and Cornell are reticent. According to the answers, Johns Hopkins, Columbia, and the Naval Academy alone, have important collections of the score or more of mathematical journals desirable in connection with university work. To the question, Is the mathematical teaching by text-book or lecture? 46 answer, by text-book; 65, mainly by text-book; 55, by both; and 2, by lecture. As regards the relative disciplinary value of analytic and synthetic mathematics, 54 per cent. of the persons answering prefer analytic; 23 per cent. see no difference between them; 15 per cent. prefer synthetic; 8 per cent. think with Professor Simon Newcomb that the synthetic gives the more valuable training in the earlier stages of a mathematical education, but later the reverse becomes true. About 30 per cent. express themselves as believing that the infinitesimal method of presenting the calculus independently of other methods, is rigorous and logical. Almost all the others condemn it. In regard to the relative aptitude of the two sexes for mathematical studies, a majority of the answers favor men, while a fair-sized minority think there is no difference.

A number of the answers show the most lamentable ignorance on the part of those responsible for them. In fact, we may look upon several of the questions as being in the nature of a written examination in which our examiners are examined. Certainly, no one may learn whether geometry should be taught before algebra or not, by reading the replies of the vast majority of our American school-teachers: nor whether answers should be furnished to students of arithmetic; nor whether models are desirable in geometry; least of all, what reforms are needed in teaching. The answers of many of our college teachers are hardly a reliable guide to the anxious seeker after light. It seems absurd to expect anything but evasive answers to several of the questions. Practically no institutions are willing to confess any decrease in the number of students of higher mathematics. Over seventy are absurd enough to claim that topics are assigned for special investigation. Several of the answers are highly entertaining. We hardly feel called upon, however, to quote them, for they are

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of no possible use. Some of the questions do not admit of intelligible answers, and but few of them can lead to any useful result. Next to these questions the chief interest lies in the reminiscences by the pupils of some of our most distinguished mathematicians: Davies, Peirce, Barnard, and Sylvester. We are sorry to see in one or two cases, inflated personal accounts of contemporary Americans.

Altogether the book is somewhat confusing, being, perhaps from the nature of its subject, disconnected. It plainly shows signs of its construction from numberless catalogues, circulars of information, magazine articles, and personal letters. It lacks something that we might justly expect to find in it; namely, tables showing concisely and simultaneously the entrance requirements, regular and extra courses, and number of teachers and students in mathematical subjects at our representative colleges and schools. The work closes with a number of essays upon subjects in geometry and algebra which have been sadly neglected by most of our text-book writers, even those of very recent date. These essays present their subjects clearly and are sure to have an influence upon our future text-books.

THOMAS S. FISKE.

Einführung in die Pädagogik. Von DR. J. BAUMANN. Leipzig: Veit & Comp., 1890. pp. vi., 120.

Professor Baumann's book is not very different from a great many other introductions to the scientific study of education. It is at once compact and comprehensive, while its aim is severely practical and by no means ambitious. It has been written, as we learn from the preface, in answer to the question, What should the teacher know about the science of education when he begins his career, in order that his activity may be both intelligent and fruitful? The answer consists of two parts: a sketch of the history of educational theories, and a survey of educational psychology. In the former, the outlines of the doctrines of Aristotle, Quintilian, the Jesuits, and Beneke are noticeable for accuracy and conciseness. A great deal is said in a very small space. Herbert Spencer is dismissed in a foot-note with the curt remark that apart from their relation to the doctrine of evolution, his educational teachings are merely a repetition of those of Pestalozzi. This at least overlooks Mr. Spencer's power of lucid statement, and

the great influence of his book on education among English-speaking peoples. Even if it is strictly true that he merely follows Pestalozzi, he is entitled to a word of recognition for so immensely extending Pestalozzi's influence.

Professor Baumann incidentally mentions (p. 73) a point which some of our English and American writers would do well to bear in mind, when he says that educational psychology can afford to pass over entirely very many questions with which pure psychology must busy itself. How many of our authors have thought of this when writing on the applications of psychology to education?

The brief section dealing with the will suggests many interesting reflections and will repay study.

N. M. B.

Adolf Diesterweg's Pädagogik in systematischer Anordnung und zur Einführung in das Studium der wissenschaftlichen Pädagogik, bearbeitet von HEINRICH SCHERER. Giessen: Emil Roth, 1890, pp. 186.

Adolf Diesterweg was to the teachers of Prussia and Germany what Horace Mann was to the teachers of America. Mann has not left us any complete work on education. His utterances, though weighty and consequential, were more or less fragmentary. Like Horace Mann, Diesterweg was "a fighting member on the floor." As normal school principal, as member of the lower house of the Prussian Diet, and as journalist, he has published much that aroused great enthusiasm at the time and has had great effect since, and many of his pithy expressions have become classic. One of the most noteworthy of the numerous books and pamphlets published in honor of the hundredth anniversary of Diesterweg's birth is this one of Scherer's. The best celebration of the day would, of course, be an inducement to the diligent study of Diesterweg's writings. If Diesterweg were living, he would say with the poet: "Wir wollen weniger erhoben und fleissiger gelesen sein!" He never found the leisure to prepare a systematic exposition of his views. His writings consist of pamphlets, fugitive articles, speeches, circular letters, etc.

The author of this book deserves the thanks of the teaching profession for having given us in Diesterweg's own words a connected system of pedagogics, gathered from the almost innumerable publications and public utterances of that great educator. The book is done with admirable faithfulness to

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the originals. The following are the chapter headings, which we place here for the purpose of showing both the valuable contents of Scherer's book, and Diesterweg's great versatility: object of pedagogy, object of education, human nature and its laws of development, purpose, aims and means of education, methods of teaching, general and special pedagogy, professional training of teachers, external conditions of the school, special methodology, theories of education, school organization, management, etc. The introduction contains a short historical exposé of the common school pedagogy from the time of Luther to Diesterweg, and a sketch of Diesterweg's own life and labors. A supplement contains notes and sources of information, as well as a well-arranged guide to the Diesterweg literature.

What makes this book so interesting is the evident attempt of the author to demonstrate that the Herbartian school cannot claim to be the only one which places pedagogics on a scientific basis, but that Diesterweg stood on ground as firm as that occupied by the disciples of Herbart. In this attempt, I think the author is eminently successful.

L. R. KLEMM.

Erasmus. By R. C. JEBB, Litt. D., Regius Professor of Greek in the University of Cambridge. Cambridge: At the University Press, 1890, pp. 55.

In the Rede lecture for 1890 Professor Jebb had a great opportunity. Having selected Erasmus for his subject, it was natural to suppose that the lecturer, one of the ripest classical scholars of his time, would analyze the humanistic movement, at least so far as it affected England, and examine carefully the relation of Erasmus to it. This would naturally have led to some estimate of the permanent value of the services of Erasmus to English culture and English classical scholarship. The personality of the lecturer himself justified such a supposition. The reader who opens the present little volume with any such idea, is doomed to serious disappointment. We have here a bare biography of Erasmus, interesting enough in style, but essentially commonplace in matter. If written by an ordinary student, it would be commendable; from Professor Jebb one has a right to expect something more striking and original. One or two passages will indicate how much more might have been said. "Two things broadly distinguish him [Erasmus], as a

scholar, from the men before and after him. First, he was not only a refined humanist, writing for the fastidious few, and prizing no judgment but theirs; he took the most profitable authors of antiquity,—profitable in a moral as well as a literary sense,—chose out the best things in them,—and sought to make these things widely known, applying their wisdom or wit to the circumstances of his own day. Secondly, he had an educational aim,—and this of the largest kind. The evils of his age,—in church, in state, in the daily lives of men,—seemed to him to have their roots in ignorance,—ignorance of what Christianity meant,—ignorance of what the Bible meant,—ignorance of what the Bible taught,—ignorance of what the noblest and most gifted minds of the past, whether Christian or Pagan, had contributed to the instruction of the human race. Let true knowledge only spread, and under its enlightening and humanizing influence a purer religion and a better morality will gradually prevail" (pp. 36, 37). "The work which Erasmus did was one which, at that time, was of the first necessity for the Northern nations. In his genial, popular way he made them feel the value and charm of the classics as literature; he himself was, in fact, a learned man of letters rather than a critical specialist (p. 41)."

Professor Jebb warmly defends Erasmus against the charge of cowardice and worldliness, so often brought against him because he did not renounce his allegiance to the Church of Rome and ally himself with Luther.

N. M. B.

The Time-relations of Mental Phenomena. By JOSEPH JASTROW, Professor of Psychology at the University of Wisconsin. New York: N. D. C. Hodges, 1890, pp. 60.

Prof. Jastrow's monograph is a valuable addition to the series of reprints from *Science*, and one likely to interest teachers. There is a widespread hope that the measurement of mental processes may be of help in developing the science of education, but the recent researches dealing with this subject are mostly technical and difficult of access. We therefore gladly welcome Professor Jastrow's summary of a large number of papers scattered through many reviews in different languages. The study of mental time, apart from its theoretical importance, seems to have certain aspects of practical interest to the teacher. Length of life is measured by rate of

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thought. If the heavenly bodies and our clocks should begin to move faster than they do now, while the rate of thought and movement remain the same, there would be more hours and years in our lives, but we should not live any the longer. If, on the other hand, the rate of thinking and moving should increase, we should in a given number of years live longer than we do now. It is therefore a matter of great practical importance to discover educational methods which increase the quickness of mental processes without injury to their intensity and breadth. There are cases in which this has been accomplished. Thus, an educated person can name a word in about half the time that he can name a color, having learned to name the word more quickly in the course of his education. And this is not all. It takes about one half of a second to see and name a single word; whereas if words are placed in a list, so that several may be seen at once, they can be read in about one quarter of a second; and if in addition to this the words make sentences, they can be read in about one eighth of a second. Thus education quickens the time of a single mental process, and in addition to this broadens the grasp of the mind, so that acts which in an imperfectly educated mind are successive, become simultaneous in the trained mind. This is only an example. The time it takes to remember, for one idea to suggest another, and, indeed, the time of every mental process seems to be quickened by correct training. So, without adding to the years of life, we are able to add to its length. But whoever wishes to know what has been gained by measuring the time of mental processes, must be referred to Professor Jastrow's monograph, where he will find it set forth clearly and completely.

J. McK. CATTELL.

Our Dictionaries and other English Language Topics. By R. O. WILLIAMS. New York: Henry Holt & Co., 1890, pp. 174.

This little book is a collection of short papers or notes on matters connected with the English language, and certain usages and peculiarities in English speech—papers of the half scholarly kind, which seem learned to the ignorant and trivial to the scholar, and yet are not without a certain agreeableness for both. We have here discussed the use of the word "metropolis," concerning which we are told that anciently it

meant a cathedral city (though we are not told that still more anciently it meant a city which had sent out colonies, and hence was called a "mother-city"), but that for the last three hundred years or so there has been a tendency to use it for any chief or eminent city. The writer raises, without answering, the question whether it should be used in America to mean "capital" or "chief commercial city." To which we should answer: "If you mean 'capital,' say 'capital'; if the other thing, say that thing; and leave 'metropolis' to the newspapers."

He shows at some length that various words and phrases often noted as Americanisms have been used by good English writers, and that others, which purists cannot away with, are simply survivals of ancient use; and discusses the questions whether "audience" can be properly used for "spectators," whether we should say "different to" or "different from," "stage" or "stage-coach"; and whether it is good English to speak of a "sidewalk," a "freight-car," and a "railroad."

The most interesting of these papers is that entitled "Good English for Americans," in which he takes the sensible view that while it is greatly to be desired that the English speech should remain one tongue all the world over, and that in the main the usage of careful writers and speakers on both sides of the Atlantic will be the same, yet the continuous growth of the language under circumstances so different will bring about certain diversities; nor is this a fact to be regretted. We heartily approve the importance here attached to idiomatic speech. Idioms are the life and finer spirit of a language; and nowhere is the master's hand so surely recognized as in his use of idiomatic phrases.

The longest paper, and that which gives the name to the volume, is a little historical sketch of the development of English lexicography, with brief notices of the more important dictionaries. It is not uninteresting reading, though we could have wished the writer had spared his unwise and petulant carping at that monumental work, the dictionary of the English Philological Society, a work to which hundreds of scholars, in both England and America, have contributed their learning, time, and labor. When he expresses the opinion that the work is full of errors, he might at least have supported his statement by pointing out one. This he has not done; but, as the next best thing, he has quoted from Mr. Fitzedward Hall the exposure

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of an error in a quite different book. It is always easy criticism to say "the picture would have been better if the painter had taken more pains"; but to specify and correct errors is somewhat harder. Part of this paper might very well be instanced as exemplifying a term whose loss he regrets: *onology* (p. 7). But to save our manners we hasten to inform him that *onology* does not mean "talking like an ass," any more than *icthyology* means "talking like a fish," or *cosmology*, "talking like all creation."

WM. HAND BROWNE.

A Stem Dictionary of the English Language for Use in Elementary Schools. By JOHN KENNEDY. New York: A. S. Barnes & Co., 1890 pp. x., 282.

This is a companion book to *What Words Say* by the same author. It contains in convenient form for easy reference a list of some six thousand composite words, mostly of Latin and Greek derivation, and an exhaustive vocabulary of English stems derived from non-Teutonic sources. Throughout the book are numerous quotations from standard authors, exemplifying the correct use of the stems discussed. There are, besides, a great number of interesting foot-notes, covering a wide range of information relative to the history and growth of words.

No study, perhaps, is more intensely interesting to the adult scholar, possessed of the requisite language training, than that of tracing out the natural history of words.

Yet this discipline, no less valuable than pleasurable, is denied to the great majority of persons by reason of a common neglect in our schools to give early and systematic instruction in word analysis. The cause of such neglect is the prevailing impression that a knowledge of Latin and Greek is an absolutely necessary prerequisite to any such instruction. The author, in an admirably written preface, has very forcibly exposed the fallacy of this assumption. Below the high school, he would treat every stem as an English stem, making no reference whatever to any other origin. Thus he would remove the great bugbear that stands in the way of undertaking word-analysis by those who are not classical scholars. Many who would shrink from teaching the meaning of such stems as *fract*, break, and *tang*, touch, as Latin forms, would

have no hesitation whatever if they could be referred to as English stems. When the time comes, later on, to identify *fract* and *tang* as Latin stems also, the task is easy and the association of form and meaning complete. There are two broadly distinguished methods of teaching the meanings of composite words: (1) by exact description and formal definition with no allusion to value of stem or affixes, (2) by calling attention to the significant elements, and inferring therefrom the content or meaning of the word. The former method takes no notice of the form of the word as throwing any light upon its meaning; that is to say, composite words are treated as primitives and the plain advantage to be gained by learning once for all the common elements in many words is not made use of.

The distinction in practice is quite analogous to that of teaching reading by the word method exclusively. The time comes when the child is bound to notice the literal elements and ascribe to them a value, and all his later acquisitions of new words will be made easier by his ability to perceive readily their common elements. So in word-study, a knowledge of the significant elements is an enormous aid in securing an enlargement of vocabulary while reducing to a minimum the strain upon the memory. Nevertheless we have every reason to believe that the great majority of teachers throughout the country do little or nothing with word analysis, but teach all words arbitrarily and as individual forms. We need not wonder, therefore, at the poverty of language, not to say of thought, that characterizes our elementary schools. But the difficulty in the way of this analytical study of words has been the lack of any good text-book on the subject. This need Mr. Kennedy has made an effort to supply in his *What Words Say* and *Stem Dictionary*.

A most careful examination of the plan and scope of both of these language books has convinced us of their great merit and unquestioned utility. Still they are not without their serious defects. In the preface to the *Stem Dictionary* (p. iii.) the author makes the following statement: "A word built up from a familiar stem needs no definition." This in many, if not most, cases is not the fact. Take, for example, so familiar a word as diameter (measure through). The precise content of the word cannot be ascertained from the analysis. The measure must be through the center and must terminate in the circumfer-

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ence, facts of vital importance to a clear and correct concept. Or, take for instance the first word treated in *What Words Say*; namely, abyss (*a*, without, *byss*, bottom). Logical definition includes both genus and difference. The analysis above given furnishes only the latter. What is to prevent a child's identifying a bottomless pail with an abyss, for instance? It will never do to abandon altogether the practice of formal and exact definitions, and that, too, for reasons other than those admitted by the author,—namely, "for logical treatment of a subject," and "to carry on a line of reasoning."

To secure precision of thought and accuracy of statement, to cultivate the habit of reducing a concept to its logical limitations, is not the least important duty of the careful teacher. The habit of inferring the meaning of a word from the general resemblances of form, is liable, if not held in restraint, to make close observers but loose thinkers.

It is to be regretted that the author has permitted his work to be marred by hasty editing or careless proof-reading, errors, perhaps, that will be corrected in a second edition. For instance, we turn at random to p. 149. Under stem *particip* we find the English derivative *particípal;* also in the line below we find *particips*, which is hardly permissible in good Latin. So, in the same column, at the bottom of the page, under stem *past* (feed) we are given its Latin source as *passere*, an infinitive that will hardly be recognized by a Latin scholar. It is unnecessary perhaps to observe that in such a work as this absolute accuracy is essential.

The etymologies of the *Stem Dictionary* are generally correct, the author having followed the best English authorities. Inaccuracies wherever they occur will doubtless, like errors in proof-reading, be remedied in a later edition.

A. B. P.

Manual Training in Education. By C. M. WOODWARD, Ph. D. New York: Scribner & Welford, 1890, pp. viii., 306.

Dr. Woodward is nothing if not polemical. He opens this volume with an attack on "the traditional curriculum beyond the primary grades." He closes it with an onslaught on the report of the Committee on the Educational Value of Manual Training, presented to the Council of Education at Nashville, in July, 1889. Between the two attacks, he expounds the "scope and content of manual training" as he understands it;

with minuteness of detail he describes exercises in joinery, in wood carving, in wood-turning, in pattern work and molding, in work at the anvil and forge, and in bench and machine-tool work on metals; he quotes testimony given by parents and guardians of pupils in the St. Louis Manual Training School, and by graduates of that institution, as to the beneficial effects of the education it affords; and he endeavors to set forth the psychological argument in favor of manual training. But in every part he lays about him with right good will, and hits with perfect impartiality both the confessed opponents of manual training and those who cannot quite accept his peculiar views of that branch of education.

It will be readily admitted that the technical parts of Dr. Woodward's work—those in which he describes the exercises in woods and metals—are well done; and that some of his replies to the report are not only effective but crushing. It will be conceded that he draws a clear line of demarcation between trade schools and manual training schools. But what of all this? It has all been done as well before, or even better. It did not remain for Dr. Woodward to expound either the method of making mortise and tenon joints, or the difference between a trade school and a manual training school. Indeed, though giving him due credit for all that is good in the book, the prudent advocate of manual training cannot fail to deplore its publication. It will probably do more harm than good. It will do harm, first, because, pedagogically speaking, it strives to narrow the field of manual training. It will do harm, in the second place, because the author manages to make such a jumble of his psychological argument as to expose a weak point to the artillery of his enemy. And, lastly, it will do harm because the style is often both awkward and ungrammatical; so awkward and so ungrammatical as to convict the author of at least gross carelessness.

The nearest approach to a definition of manual training is found on page 61: "Manual training covers the two features of drawing and tool work. The former I have already outlined. The tool work includes both the theory and practice of a great variety of tools on an equal variety of materials." As "tool work" does not commence, in the author's curriculum, until a boy enters, at fourteen, a manual training school, and as the drawing "already outlined" (pp. 54–56) refers exclusively to the drawing that is preparatory to tool work, it is certainly a

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fair conclusion that he excludes from "manual training," everything, no matter of what character, that may be done in a school of lower grade than his own. The block-building, the stick-laying, the paper-folding, and the clay-work of the kindergarten; the paper-folding, the paper-cutting, the clay-work, and the penmanship, of the primary grades; the drawing, the paper-cutting, the making of geometrical solids in pasteboard and in wood, the sewing, and the cooking, of the grammar grades; all these he would exclude from the definition of manual training. And yet it would not be difficult to show that the same intellectual and the same physical powers are employed in these exercises as in those of the St. Louis Manual Training School. It would be an easy matter to demonstrate that the object of all these exercises is the same—the training of the powers of expression, and of the judgment, and of the executive faculty, by delineation and construction. But such a demonstration is not necessary. The great majority of the advocates of manual training believe that it should begin with the kindergarten and end only in the university; and when Dr. Woodward attempts to demolish their position by his favorite argument,—*reductio ad absurdum*—he falls into an error that would be amusing were it not unpardonable. He says (p. 52): "The etymologists would fain claim as *manual training* all the educational work in which the hand is used. This is as uncalled for and as unreasonable as it would be to claim everything as *pedagogic* which is driven by the foot,—*e. g.*, a foot-ball or a sewing-machine." Is it wonderful that a man who is capable of such an error in etymology should "prefer to ignore" the etymology of a word (p. 52), should be willing to "abandon the dictionary" (p. 53), and should sneer at Plato and Milton (p. 135)? The author's ignorance of the derivation of words is equaled only by his inconsistency; for he himself practically admits (p. 249) the identity, in aim and in result, of the kindergarten and the manual training school, in the following language: "Mr. Harris once said that a child trained for one year in a kindergarten would acquire a skillful use of his hands and a habit of accurate measurement which would be his possession for life. How can I adequately express the value of the rich and varied possessions gained by a boy in his teens, having a daily exercise of from one to two hours for three or four school years in a good series of school-shops!" What does this mean but that the two courses of training, while

differing in degree, are the same in kind? There would be no objection to Dr. Woodward's claiming that there is no manual training below schools of the grade of that over which he presides, were it not that he is put forward, or puts himself forward, as the champion, before the world, of manual training in America. The champion who abandons a great stronghold to the enemy will not inspire confidence in his own forces.

The author opens his psychological argument (p. 204) in this wise: "The first and greatest faculty to be trained is sense-perception." Were we told that sense-perception is the *greatest* faculty of the mind, the language, though perhaps untrue, would at least be intelligible. But what is the meaning of "the greatest faculty to be trained?" Then he proceeds: "Here the influence of manual training is in every way remarkable. In ordinary vision not one per cent. of what falls upon the retina is perceived by the mind." How is it proved that in ordinary vision only one per cent. of what falls upon the retina is perceived by the mind? The fair inference from the language quoted is, that the author, or some one else, with the extraordinary perceptive powers evolved by a course of manual training, is enabled to perceive 100 per cent. of what falls on the retina; and, by comparing his developed with his undeveloped condition, is enabled to determine the exact fraction of what falls upon the retina "in ordinary vision" that is perceived by the mind. This is the fair interpretation of the language used; of course it is not the real meaning. What, then, is the meaning? The next two sentences throw but little light on the question:

"In true perception, as Dr. Harris has clearly shown, all the figures of logic and consequently all the faculties of the mind are consciously or unconsciously called into service. Knowledge and experience and memory and generalization are necessary to the operations of logic, and manual training is particularly strong in furnishing the knowledge and experience, in establishing the major premises essential to logical reasoning."

Waiving the question as to whether there can be any "reasoning" that is not "logical," or whether "logical reasoning" is not one of the many instances of tautology to be found in this book, we may inquire whether "generalizations" are not themselves the "major premises" in most cases of deductive reasoning, and whether it is not the most important work of inductive logic to arrive at generalizations. Manual training undoubt-

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edly furnishes some data upon which to found generalizations. But that it is the chief source of such data, even Dr. Woodward would hardly claim. Again, he says: "Moreover, several senses join in the search for truth; sight and sound and touch and muscular force testify together." How long is it since sound was included among the special senses? And again: "A man without personal experience of the external world perceives nothing outside himself." What magnificent tautology! The propositions might with equal propriety be reversed: "A man who perceives nothing outside himself is without personal experience of the external world." They are identical in meaning. And yet again: "A person devoid of experience with the manifestations of force, has no conception of cause and effect." Of course he has not. But then, was there ever a thinking human being who had no "experience with the manifestations of force?" The conclusion forced upon the attentive reader of this chapter is that the author is either very ignorant of psychology or very careless in his statement of what he knows.

The limits of space forbid my entering at any length upon the third count in the indictment against Dr. Woodward—that his language is often awkward and ungrammatical. A few examples, out of hundreds that might be adduced, must suffice. Take this sentence found on p. 209: "The charge is generally false, and the manual training school has proved what I say over and over again." There is no doubt that the author does say things "over and over again," but it is to be presumed that he wanted to assert repetition of the manual training school, not of himself. On p. 209 he speaks of "concrete forms and tangible forces." A tangible *force*, as the term is used in natural philosophy, would be an interesting thing to handle. The following is ambiguous: "The interest he [a boy] takes in the saleability (*sic*) of his work is short-lived; it soon changes to a protest and disgust if carried far." What is it that changes to a protest and disgust—the interest, the "saleability," or the work? On p. 220 he uses the word committee in the plural, and on the very next page he uses it in the singular. Repeatedly he speaks of manual training being "taught," and of "teaching" manual training. On p. 238 the looseness of his writing is the only thing that will absolve him from the charge of applying very unbecoming language to the Committee of the National Council: "The magnitude of the Committee's error in

all this is past measuring. These unfortunate men exhibit the fruit, not of manual training school education, but of a want of it." Of tautologies such as "a quality and manner of teaching" (p. 262), of anticlimaxes such as "nothing is more fatal and disappointing" (p. 262), and of solecisms such as "let me warn the teacher not be misled" (p. 265), examples could be selected from nearly every page. Dr. Woodward never tires of insisting that the accuracy required in the use of tools and materials influences every other department of effort. It is to be regretted that he does not himself furnish an example.

A book that presents only a partial view of manual training, that is confused and confusing in its psychology, and that is loosely written, can have little to win commendation. The things in it that are done well, are not necessary; the things that are necessary, are not done well.

W. H. M.

Bowser's Elements of Geometry.

To the Editors of the EDUCATIONAL REVIEW:

In the interest of fairness and justice to a distinguished mathematician, whose writings are used as text-books in more than eighty colleges and universities, I desire to protest against the judgment passed on Dr. Bowser's new "Geometry" in the January issue of the EDUCATIONAL REVIEW. Many remonstrances against the opinion of Mr. Ridenour have reached me from mathematical teachers in various parts of the country. That your reviewer's estimate of Dr. Bowser's mathematical ability is not a correct or just one, is shown by the increasing success and popularity of his works.

T. S. DOOLITTLE.

RUTGERS COLLEGE,
NEW BRUNSWICK, N. J.

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VII.

EDUCATION IN FOREIGN PERIODICALS.

The German Emperor's Address to the Commission on School Reform.

TRANSLATED FROM THE OFFICIAL REPORT IN THE "REICHS-ANZEIGER."

GENTLEMEN: I rise before any one else in order to address to you a few words, because I desire that you shall know, from the outset, what my views concerning this matter are. Many things, no doubt, will come up for discussion upon which no decision can be reached, and many a point will, I suppose, remain in the dark. I have thought it advisable, therefore, that you should not be left in doubt as to what my sentiments on these topics are.

In the first place I should like to state that this school question which we are to consider, is not a political question, but a purely technical and pedagogic one, concerning how to educate our youth in conformity with the demands which the circumstances of our life and the position of our Fatherland make upon us. And right here I want to say just one thing. I should have been very much pleased if these investigations or discussions had been called by the German word *Schulfrage*, instead of by the French name *Schulenquête*. *Frage* is the old German word for preliminary investigation (*Voruntersuchung*). Let us therefore call this simply *Schulfrage*.

In reading over the fourteen points proposed for discussion, I find that they may easily lead to a mere schematizing of the questions in controversy. That would be in the highest degree deplorable. The main thing is to get hold of the spirit of the subject, and not of the form only. So I myself have drawn up a few questions, which will be handed to you, and which will, I hope, receive your consideration.

First, "school-hygiene, outside of school-gymnastics,"—a matter that deserves your most careful consideration; then "the lessening of the curriculum (what may be omitted?);" then "plans of study for the different branches." Again, "methods of teaching under the reorganization,"—these being the most important points; next, "has the chief ballast (*Hauptballast*) been thrown out of the examinations?" next,

"will the overtaxing of pupils be avoided in the future?" next, "how can a controlling supervision be exercised, after the organization has been accomplished?" finally, "the subject of regular and extraordinary revisions by different higher authorities." I lay these questions on the table of the house where every one who so desires can inspect them and get more particular information concerning them.

This whole matter, gentlemen, has developed by degrees and entirely out of itself. You stand here face to face with a question, the solution of which you, no doubt, by the finish you will give it and by the form you will impress upon it, will present to the nation as a fruit in its full ripeness.

This order in council (*Kabinettsordre*), which the Minister had the kindness to refer to, would, perhaps, have been unnecessary, if the schools had stood at the standpoint which they ought to occupy. If I shall become somewhat sharp in my subsequent remarks, I will state here, in advance, that these remarks refer to no one in particular, but to the system, to the whole situation of affairs. If the schools had accomplished what *must* be demanded of them—and I can speak to you as one who is not unfamiliar with them, for I have attended the Gymnasium and know how things go there—they, of their own accord, would have undertaken the fight against social democracy from the very beginning. The teaching faculties of our schools ought to have taken a firm hold of the situation, and ought to have instructed the growing youth in such a way that the young people who are of my own age, about thirty, would now furnish me the material wherewith I might accomplish the overthrow of this movement. But such has not been the case. The last time, when our schools still determined our national life and our development, was in the years 1864, 1866–70. In those days the schools of Prussia and the teaching faculties were still the exponents of the idea of national unity, which was preached everywhere. All graduates who left their school and entered upon the duties of life or upon their military service of one year, were agreed on this one point: the German empire is re-established and Alsace-Lorraine is again won back. With the year 1871 this enthusiasm ceased. The Empire is united, we have what we longed for, they said; and that was the end of it. At that moment it ought to have been the duty of the school, starting from this new basis, to inspire the young and to demonstrate to them

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that the new government was created with the purpose of maintaining it. Nothing of this, however, has been said, and centrifugal tendencies and forces make themselves felt already, although the time since the establishment of the empire is very short, indeed. I am certainly in a position to judge, for I stand somewhat above these movements, and have to meet all these questions.

The reason for all this lies in the education of our youth. But where is the fault? In many places, to be sure. The main trouble lies in the fact that since 1870 the philologists have sat in their Gymnasia as *beati possidentes*, laying main stress upon the subject matter, upon the learning and the knowing, but not upon the formation of character and the needs of life. You will excuse me, Herr Geheim Rat Hinzpeter, I know you are an enthusiastic philologist, but still this matter has already gone too far, in my opinion, and must now be stopped. Less emphasis is being placed upon practice (*können*) than upon theory (*kennen*), a fact that can easily be verified by looking at the requirements for the examinations. Their underlying principle is that the pupil must, first of all, know as many things as possible. Whether this knowledge fits for life, or not is immaterial. If anybody enters into a discussion with these gentlemen on this point and attempts to show them that a young man ought to be prepared, to some extent at least, for life and its manifold problems, they will tell him that such is not the function of the school, its principal aim being the discipline or gymnastic of the mind, and that if this gymnastic were properly conducted, the young man would be capable of doing all that is necessary in life. I am of the opinion that we can no longer be guided by this doctrine.

To return to schools in general and to the Gymnasium in particular—I will say that I am not ignorant of the fact that in many circles I am looked upon as a fanatical opponent of the Gymnasium, and that I have therefore often been played as a trump-card in favor of other schools. Gentlemen, this is a misapprehension. Whoever has been a pupil of a Gymnasium himself, and has looked behind the scenes, knows where the wrong lies. First of all, a national basis is wanting. The foundation of our Gymnasium must be German. It is our duty to educate young men to become young Germans, and not young Greeks and Romans. We must relinquish the basis which has been the rule for centuries, the old monastic educa-

tion of the Middle Ages, when Latin and a little Greek (*ein bisschen Grieschisch*) were most important. These are no longer our standard; we must make German the basis, and German composition must be made the center, around which everything else revolves. If a young man, in his graduating examination, (*Abiturientenexamen*), writes a faultless German composition, the degree of his intellectual development can be judged, and an estimate as to his worth can easily be made. Of course, many replies and objections are made to this. They say, Latin composition is also a very important factor; it helps one to understand a foreign language, etc. To be sure, gentlemen, I know this from experience. But how are such Latin compositions gotten up? I have more than once seen a young man receive the mark 4+ (*i.e.*, on the whole, satisfactory) in his German composition, while in his Latin composition he stood 2 (*i. e.*, good). The young man deserved punishment instead of praise; for it is easy to see that other than legitimate means were employed in writing his Latin composition. Indeed, of all the compositions we did, there was not one in twelve that was not prepared by the employment of such means; but these compositions were marked "good." This much as to the Latin composition. But when we had to write a composition on "Minna von Barnhelm" we barely reached the mark "satisfactory." Therefore, I say, away with the Latin composition. It is an obstacle. We lose time by it that properly belongs to German.

There is another point, which I should like to see more developed with us, that is the idea of the "National," (*das Nationale*) in questions of history, geography, and popular and heroic tradition. Let us begin at home. Just as we must first be able to find our way through the different chambers and rooms of our own house before we can visit and inspect a museum, so we ought first to know our national history. The picture of the Great Elector, drawn to me in my school-days, was very vague and indistinct. The Seven Years' War lay outside of our course, and history terminated for us with the end of the last century, with the French Revolution. The struggles for liberty (*Freiheitskriege*), which are of the highest moment for the young citizen, were passed by, and it was only through a series of supplementary and very interesting lectures by Herr Geheim Rat Hinzpeter, that I had, thank the Lord, a chance to hear of those events.

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But just here lies the *punctum saliens.* Why are so many of our young people led astray by crude theories? Why is it that so many so-called reformers of the universe (*Weltverbesserer*) make their appearance among us with their confused and incoherent notions? What is the reason why so much fault is continually found with our government, and we are perpetually referred to foreign nations for examples? Because our young people are ignorant as to the historical evolution of the conditions of our time, and as to the fact that they are the outgrowth of the age of the French Revolution. I am firmly convinced, therefore, if the outlines of this development from the French Revolution to contemporary history were presented to our youth in a simple and objective manner, that they would obtain an entirely different understanding of modern issues and questions from that which they have had heretofore. Thus prepared, they would be able to improve and extend their knowledge when they subsequently hear lectures at the universities.

Now, as regards the time spent in school work by our young people. It is evident that the number of hours must be reduced. Herr Geheim Rat Hinzpeter no doubt remembers that it was at the time when I was a pupil of the Gymnasium at Kassel, that the first cry of danger was raised, and a halt was called for by parents and families. Aroused by these demands, the government made inquiries. We pupils were compelled to hand to the Director a report stating the number of hours we required to complete and master our tasks for the coming day. I will only state the number of hours necessary in the graduating class (*Prima*), to accomplish what was expected of us—Herr Geheim Rat Hinzpeter was able to control mine. I required 5½, 6½ to 7 hours per day for home work. Add to that number, 6 hours at school, 2 hours for meals, and you can figure for yourselves what remained of the day. If I had not had the opportunity of riding to and from school, and of taking some other outdoor exercise, I should never have known how the world looks. You will certainly grant that such tasks as these cannot be imposed upon young people for any time with impunity. Not only in the upper grades, but also in the lower ones, a change for the better, a reduction, must be brought about. Gentlemen, the bow has been stretched to its fullest tension and it cannot stand this strain. We must come down, we have already

gone beyond the proper limit. The schools—but I will confine myself to the Gymnasia,—have made superhuman efforts, and they have produced a surplus of educated people, which is larger than the nation can stand, and too great for the good of these people themselves. The expression *Abiturientenproletariat*, which originated with Prince Bismarck, finds here its verification. Nearly all the so-called *Hungercandidaten* (people who can barely eke out an existence), especially the journalists, are shipwrecked gymnasiasts; and this is a danger to us. These morbid conditions, which exist in too high a degree, must be removed—the meadow cannot absorb any more water. I shall, therefore, not permit the founding of any new Gymnasium that has not clearly proved its right to existence. We have enough of them now.

The question, then, before us is, how can we best reach the desired results with regard to classical and scientific training (*Real-bildung*), and as to the requirements for the one year's service in the army? The easiest way, in my opinion, to get at these results, is by changing, with one decisive and radical step, our former views, and by saying: Classical Gymnasia for classical education and another kind of schools for scientific training (*Real-bildung*), but no Real-Gymnasia. The Real-Gymnasia are only half-way measures, which give but a partial education and produce, therefore, only incomplete preparation for life.

On the other hand, the directors of Gymnasia have a just cause in complaining of the heavy ballast of pupils, whom they have to carry along, but who never come up for final examinations, nor intend to go beyond the examination that entitles them to the one year's service in the army. But then, this complaint can easily be removed, by inserting the military examination at the stage when the pupil is ready to leave, and furthermore, by making the one year's service of the pupil of the Realschule, dependent upon his graduating certificate. The result of this will be that all the applicants for the one year's service will exchange the Gymnasium for the Realschule, because there, in passing through that school, they will get what they look for.

To these remarks I want to add another point, to which I have already alluded: namely, that a reduction in the subject-matter to be taught, is only possible by simplifying the examinations. Eliminate all grammatical questions or productions

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from the graduating examination (*Abiturientenexamen*), and give them a place one or two years before the final one. Then you can examine the pupils as rigidly as you please. You will have a chance to combine with this the examination for the one year's service, and, for the benefit of those who intend to become officers of the army, the examination for ensigns (*Fähnrichsexamen*), from which they will then be exempt thereafter. After having thus modified the examination and relieved the Gymnasia, that element will again reappear, which has vanished in our schools, especially in the Gymnasia, namely, true education, the formation of character. Under the present condition of things this cannot be reached, even with the best intentions, when there are in one class thirty boys, who have to master such a task, and when, as in many cases, there are young instructors, whose own character very frequently admits of great development. The remark of Geheim Rat Hinzpeter is here in point: "He who wishes to educate, must be educated himself." But this education cannot be said to characterize the teaching profession without exception. In order to facilitate this education, then, the classes must be reduced, and this reduction can be brought about in the manner described. Moreover, we must abandon the opinion that all that the teacher has to do is to give a number of lessons daily, and that he has fulfilled his duties when this work is done. If the school requires the youth to be absent so many hours from his home, as it in reality does, it must also shoulder the responsibility for his education. You *educate* the youth and we still have a different class of graduates. And, lastly, we must turn aside from the principle that it is the theory we are after and not the practice; the young man must be educated for practical life.

I have taken down a few figures, which from a statistical point of view are very interesting. In Prussia, there are 308 Gymnasia and Progymnasia, with 80,979 pupils; 172 Real-gymnasia and Real-Progymnasia, with 34,465 pupils; 60 Ober-Realschulen and Higher City Schools (Höhere Bürgerschulen), without Latin, with 19,893 pupils. The examination entitling to one year's service was passed by 68 per cent. of pupils that attended the Gymnasia, by 75 per cent. of those at the Real-gymnasia, and by 38 per cent. of those at institutions where no Latin is taught. The final examinations of the Gymnasia was passed by 31 per cent., those of the Real-gymnasia

by 12 per cent., and those of the Ober-Realschulen by 2 per cent. The number of hours given, by each pupil of any of these institutions, to school and home work amounts to about 25,000, of which only 657 are set aside for gymnastics. This certainly shows an excess of brain work, which must by all means be lowered. The school hours, including those for singing and gymnastics, for a boy of 12, 13, or 14 years, amount in the third and fourth classes to an average of 32 a week, but rise in some institutions to 35, and in the fourth and fifth classes of the Real-Gymnasium to 37. Well, gentlemen, we are all pretty well matured and we work all we can, but this sort of thing we ourselves could not stand for any length of time. The statistics with regard to short-sightedness are really frightful, and with regard to many other kinds of disease, there exist no adequate reports. Let us begin to reflect, therefore, what sort of progeny we are raising for the defense of our country. I want soldiers and a powerful nation, men that can serve the country as intelligent leaders and officials. All these near-sighted people are of no particular use, for how is it possible that a man who cannot use his eyes, will accomplish much? In the graduating classes, near-sightedness has risen, in single instances, to 74 per cent. In my own class, although we used a good room, the teachers' conference chamber, as a class-room,—which, in accordance with the wish of my mother, had been well ventilated and had only side light—out of 21 pupils, there were 18 that wore spectacles, two of whom could not see the black-board. Such conditions condemn themselves, and a remedy must be found. For this reason, I think it absolutely necessary that the subject of hygiene be taught in teachers' preparatory schools, and that the teachers receive a special course in it. Besides this, each teacher who is in good health, must understand the subject of gymnastics, and must take systematic exercise daily.

Gentlemen, these are in general the points which I have to lay before you, and which have occupied my mind. I can assure you that the great number of requests, petitions, and appeals, that have been addressed to me by parents—in spite of the fact that our honored Herr Hinzpeter last year declared that we fathers ought to have nothing to say about the education of our children,—impose upon me, the common father of the country, the duty of calling a halt. Gentlemen, men ought not to look at the world through spectacles. They

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ought to enjoy with their own eyes, all that lies before them, their country and its institutions. I rely, therefore, upon your co-operation, that such a condition of affairs may be brought about.

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